July-August 1995

FAA Aviation News

A DOT/FAA FLIGHT STANDARDS SAFETY PUBLICATION

Oshkosh '95

U.S. Department
of Transportation

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The FAA's Flight Standards Service, General Aviation and Commercial Division, *Aviation Safety* Program Branch, AFS–810, Washington, DC 20591; telephone (202) 267–8017, FAX (202) 267–9463; publishes FAA Aviation News in the interest of flight safety. The magazine promotes safety in the air by calling the attention of airmen to current technical, regulatory, and procedural matters affecting the safe operation of aircraft. Although based on current FAA policy and rule interpretations, all printed material herein is advisory or informational in nature and should not be construed to have regulatory effect. The FAA does not officially endorse any goods, services, materials, or products of manufacturers that may be mentioned. **Certain details of accidents described herein have been altered to protect the privacy of those involved.**

The Office of Management and Budget has approved the use of funds for the printing of FAA AVIATION NEWS.

SUBSCRIPTION SERVICES
The Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402–9371, sells FAA AVIATION NEWS on subscription. Use the self-mailer form in the center of this magazine to subscribe. Cost: $16.00 ($20.00 foreign) for one year; $32.00 ($40.00 foreign) for two years. Prices are subject to change by the Government Printing Office without prior notice.

CHANGE OF ADDRESS OR SUBSCRIPTION PROBLEMS: Send your label with correspondence to Sup Doc, Attn: Chief, Mail List Branch, Mail Stop: SSOM, Washington, DC 20402–9373. Or call GPO Customer Service at (202) 512–1800/6; FAX: (202) 512–2168.

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July-August 1995

FAA Aviation News

VOLUME 34 • NUMBER 5

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The staff of *FAA Aviation News* and the Aviation Safety Program honor the memories of federal workers and others killed in the Oklahoma City bombing April 19, 1995—*especially the children.*

"We owe those who sacrificed the duty to purge ourselves of the dark forces which gave rise to this evil."

President Clinton at the National Day of Mourning Memorial Service, April 23, 1995

Beauty and the Beast

by Patricia Mattison, *Safety Program Manager, Juneau, AK*

One of the most awesome experiences I ever had took place at the south rim of the Grand Canyon in Arizona. Evenings at the Canyon can be extremely beautiful. The colors in the Canyon change as the sun lowers in the west. Reds, browns, and golds are replaced with purples, blues, and greens. Shadows formed by the setting sun enhance the effects of the ever changing colors. On this particular evening, clouds growing tall and majestic to the northeast promised showers later that night. Distant bolts of lightning followed by the deep, ragged rumble of thunder gave understanding to why Native Americans thought of thunder as the voices of the gods. As evening's twilight developed into nighttime darkness, the approaching thunderstorms could be seen and heard even better. St. Elmo's Fire crackled through the trees and nearby bushes. I wondered, what in the heck am I doing out here.

As a pilot and flight instructor, I was aware of the hazards of the thunderstorm; yet, the splendor of the moment urged me to stay though I knew it was dangerous to be there at the rim. Although I knew that a thunderstorm can be both beautiful and at the same time dreadfully powerful, I could not leave.

We all know that a severe thunderstorm can be catastrophic to everything in its path. It is a well-known fact that severe thunderstorms and the tornadoes they can spawn can produce some of the most severe weather known to mankind. We all know that thunderstorms can be both a beauty to behold and the beast that can threaten all. But at that moment on the rim, I could not leave the beauty of the storm in spite of the danger, a danger that I had seen much closer years earlier.

I was just a student pilot when I had the opportunity to see the effects of a thunderstorm first hand. My instructor had taken me out on my first night flight

around San Diego, CA, in a Cessna 152. In the distance we could see a storm beginning to form. I had never seen lightning while in the air before and cloud to cloud lightning was lighting up the southern sky. My instructor jokingly told me that there must be a war going on in Mexico. Suddenly an extremely bright flash lit up our cockpit. Thunder deafened us and the light blinded both my instructor and myself for a few moments. The next day the flight school mechanic found a tiny pin hole in our airplane's cowling indicating that our small 152 had been hit by a lightning bolt.

As far as we knew no storms had been forecast for our practice area. If we had known we were going to encounter one, we certainly would not have gone because thunderstorms can be very unpredictable. If they are present in your general area you shouldn't fly until the danger has passed because a small storm may be five miles or so across while a larger storm can exceed 30 miles in diameter. Depending on the lifting action present, the base of a thunderstorm can be as low as a few hundred feet in very moist areas to 10,000 feet or higher in drier climates. Tops of thunderstorms are usually 25,000 to 45,000 feet, but they can extend to more then 60,000 feet. Developing storms can grow vertically at a rate of 3,000 feet a minute, a rate that exceeds the climb capability of most aircraft. And you cannot tell the severity of a storm just by looking at it.

Because of the unique dangers of thunderstorms, the FAA's *Aeronautical (*formerly *Airman's) Information Manual* (AIM) has a large section on thunderstorms, their dangers, and how pilots should operate when thunderstorms are present or forecasted. For example, the AIM states that severe turbulence can be expected up to 20 miles from a severe storm and warns that pilots should not try to fly underneath a thunderstorm even when they can see the other side of the storm because of the possibility of disastrous turbulence or wind shear under the storm. The AIM also says that many aircraft cannot out climb a severe thunderstorm.

My thunderstorm education continued in 1979 when I became a flight instructor and was fortunate to get a job at a military flying club. During the three years that I worked there, I had two more experiences with weather related phenomena that I haven't forgotten. One involved a waterspout. The other involved imbedded thunderstorms.

One day, I was taking a new student (second lesson) on an orientation flight to Brown Field, which is located south/southeast of San Diego near the Mexican border. The weather was overcast skies with almost unlimited visibility. As we flew to the practice area just north of Brown Field, I noticed that the sky was getting very gray. We maneuvered around for a while and turned towards Brown Field for a few minutes in the pattern.

As we turned on base for landing, the sky over Tijuana, Mexico turned a sickly dark green. Just as I opened my mouth to tell the student to forget about doing pattern work, and that we should return to our home base, a waterspout formed over the Tijuana River. For those not familiar with the Tijuana River, it is a dirty river that also carries raw sewage to the ocean. That nasty concoction of river water and sewage was rapidly spinning our way. I, for one, wanted to be somewhere else. Fortunately for us, the waterspout followed the river basin and dropped its load of polluted water on an old ranch just east of the field.

What made this situation so dangerous was that we were in a position to encounter a downburst associated with the frontal activity. I shudder to think what might have happened to us if we had encountered a downburst. We were lucky. The weather that day was unforecast, and weather radar had not picked up on the storm. This incident points out an important fact about severe weather. As the AIM states, weather radar may not always detect severe weather. Normal weather radar detects only precipitation such as rain. It cannot detect turbulence without the presence of precipitation. Radar's inability to detect turbulence is why pilots should not depend totally upon air traffic radar to be able to pinpoint severe weather, especially storms without a lot of precipitation in them. Newer, Doppler weather radars are being developed that can detect turbulence through the Doppler effect. One of the most important uses for such radar is to detect wind shear at major airports. But regardless of the type of radar being used or available, avoidance is always the best thunderstorm policy and in many cases, a pilot's eyes are the best defense against severe storms.

Although pilots should use every modern technology available such as airborne radar and Doppler radar when flying to help them avoid thunderstorms, one of the earliest navigation systems installed in many aircraft can help pinpoint some types of storms. The system is the old automatic direction finder (ADF). The idea is simplicity itself. ADF is designed to indicate the direction to a signal source within its frequency bandwidth such as non-directional beacons (NDB) or AM radio stations, etc. It just so happens that lightning generates a broadband electrical signal when it discharges. A signal that can be both heard on an ADF receiver as static as well as shown by a fluctuating ADF needle that tends to point to the location of the lightning. Thunderstorms generate lightning, and its resulting electrical signals are the basis for the various lightning detectors sold today. The detectors, using modern computer technology, show the direction and intensity of lightning discharges that may indicate a thunderstorm. Used in combination with other detecting devices such as both ground and airborne radars, all of these devices help a pilot avoid such storms or navigate around them.

I wish I had had some of those devices on board for my next thunderstorm encounter. It was about a year later while I was flying with a commercial student. We had flown to Palm Springs, CA, in a Cessna 172. The weather was clear on the desert side of the mountains, but we had left a cloudy San Diego behind less than an hour before. On final approach into Palm Springs, another airplane reported wind shear with a 20-knot loss of airspeed.

We held our power up and approached with 20 knots higher airspeed than the 70 knots we usually came over the fence with. We did notice the drop in airspeed, and we were bounced around a bit, but all in all the landing was uneventful.

Before we left the Palm Springs Airport to return over the mountains to San Diego, my student called for a weather update. Scattered thunder cells had developed in the short time we were gone; however, I felt that we would be able to see the cells and avoid them. The key word here is **SEE.** After we took off, I could see that the clouds were developing quickly with the tops at 25,000 to 30,000 feet. These cells were less than scattered, but by the time we got half way back home to San Diego the sky was overcast.

Then we discovered we had a problem. We could not maintain VFR. We had to file IFR. We would have to make an instrument approach into our home field. We started at an altitude of 8,000 feet. But before we knew what happened to us, our altimeter read 13,000 feet. Now, a Cessna 172 is hard pressed to climb as fast or as high as we were at that moment. it wasn't even a bumpy ride; we just went straight up. Now we had another problem.

It is amazing how fast ice can accumulate on a light aircraft. Ice was forming on the leading edges, and we were getting heavy and slow. I told approach control that we were at 13,000 feet because of a severe updraft, we were picking up ice, and that we had to get to a lower altitude, NOW! We were cleared to 6,000 feet and after turning southwest to the heading given to us, we found that we could descend and descend we did. Approach control had no idea that they were vectoring us into that type of weather.

One last encounter with thunderstorm related weather occurred on the desert at Scottsdale, AZ. I had just decided that discretion was the better part of valor because some pretty nasty weather had developed along my route of flight. I had opted to land with my passenger and wait out the storm in the comfort of a FOB instead of pressing on to the Grand Canyon. As we were sitting in the pilots lounge a student pilot on his first long cross country flight came in and made a call to FSS for a weather update.

One thing nice about the desert is that you can see stormy weather coming. Flat terrain allows almost a 360 degree view of the area, usually for miles. FSS was calling for thunderstorms with high winds and moderate to severe turbulence all quadrants, and possible hail for the next several hours. I was aware of the weather report because I had just called for weather myself and had decided that it was too rough for me. The student however had other ideas. He got weather and a soda and started to head out the door.

"Hey wait a minute, I said, "can't you see the weather out there. It's pretty bad, and I would wait it out if I were you. The locals don't call this the Monsoon Season for nothing." He looked at me, and with bravado that only the uninitiated can muster said, "Naw, I can go around the thunder cells. I'll be fine," and off he went. I often wonder what became of that student. "There are old pilots and there are bold pilots . . . ."

Back to the first sentence in this article. A thunderstorm can be an awesome experience depending on the vantage point of the person doing the experiencing. Thunderstorms should never be taken lightly. The best way to treat a threat of thunderstorm activity is to avoid the area altogether. Should you find yourself in an area of thunderstorm activity the best course of action is alter course to avoid the storm. If you are inadvertently caught in a thunder cell, fly the attitude and airspeed and exit as soon as possible. Scattered thunderstorms can be circumnavigated easily. Hail, rain and downburst activity can frequently be felt many miles away from very active storms.

As the old adage goes, "An ounce of prevention is worth a pound of cure." ■

Some Interesting Thunderstorm Facts

1. A small storm may be 5 miles or so across while a larger storm can exceed 30 miles in diameter. Depending on the lifting action present, the base of a thunderstorm can be as low as a few hundred feet in very moist areas, or 10,000 feet or higher in drier climates. Tops of thunderstorms are usually 25,000 to 45,000 feet but can extend to 60,000 feet plus. Developing storms can grow vertically at a rate of 3,000 feet a minute, a rate that exceeds the climb capability of most aircraft.

2. Lightning strikes are caused by a discharge of electricity between the ground and a cloud as well as cloud to cloud. The frequency of lightning strikes coming from a cloud denotes the severity of the turbulence in that particular cell. You can have high electrical activity in a cell, but this does not always indicate heavy precipitation or hail. ADF equipment is particularly sensitive to static electricity in the vicinity of an aircraft. You can hear the crackle over the frequency to alert you to lightning discharges in the area. By being aware of this phenomenon, during the day when lightning is difficult to see, your electronic equipment can help you avoid flying into imbedded thunder cells.

3. Imbedded thunderstorms, hidden by an overcast, are treacherous to the pilot and may contain developing tornadoes. One obvious signature of thunderstorms is CB Mammatus clouds that frequently produce rounded cloud bases, signaling severe turbulence. It is important to note that clouds visible to the pilot do not always have the signature mammatus bases. An imbedded storm may not give any indication at all that danger is lurking within the cloud layer. Since tornado vortices can extend well into a cloud a pilot in instrument conditions could encounter a hidden vortex. It is difficult to avoid something that you can't see such as a concealed developing tornado.

4. Tornadoes are created by the most violent of thunderstorms. An extremely concentrated vortex is formed as rising air is drawn into a cloud base. Wind inside the vortex can exceed 200 knots and is fully capable of causing severe structural damage to an aircraft. Tornadoes, usually a Great Plains phenomenon, do, however, occur in every state. A water spout is a tornado that touches water. A tornado picks up water in the funnel and, when it has exhausted its energy, will release the water causing damage to anything in its path.

5. Turbulence is associated with all thunderstorm activity. Severe to extreme turbulence is the rule rather than the exception. The strongest effects are felt within the cloud with shear between updrafts and down drafts. As far away as 20 miles from the cloud it is possible to encounter moderate to severe turbulence. It can be impossible to hold altitude while experiencing the effects of this amount of turbulence. The best thing to do is to hold a level attitude and ride it out. Applying control pressure to maintain altitude will only increase stresses on the airframe. If you are using an autopilot with altitude hold, you should turn off the altitude hold.

6. Updrafts in developing and mature stage thunderstorms can exceed 6,000 feet a minute. During this stage the resulting updrafts are capable of lifting an aircraft into a developing thunderstorm. Forces exerted on the aircraft have the power to exceed the structural limits resulting in catastrophic failure. More than one airplane has been known to be sucked up into a developing thunderstorm just to be spit out at the top in pieces.

7. Structural icing conditions can sometimes develop within and near a thunderstorm. Most light aircraft are not equipped to encounter icing conditions associated with a thunder cell. Icing can add weight to an aircraft and cause loss of lift and/or control problems. Statistics show that structural ice causes, or contributes to, many accidents. Water droplets lifted through a thunder cell are super cooled to a temperature that allows them to freeze on contact with the skin of an aircraft. Super cooled water forms clear ice that is formed quickly and is hard to detect.

8. Aircraft leading edges are the first to collect ice. Ice can also form on the belly and inside of engine nacelles. The problem with ice on the belly or in the nacelles is that it is not readily visible. As mentioned above, ice also adds weight to the aircraft further increasing the stall speed. Any increase in pitch with the added weight of the ice and loss of lift caused by the ice on leading edges, will certainly contribute to a stall. If you suspect ice accumulation, don't hesitate to drop to a lower altitude if possible to allow any ice to melt. If a lower altitude is not an option, climb to an altitude where it is cold enough to prevent the further formation of ice.

9. Mountain thunderstorms, formed by orographic lifting of warm moist air, are especially dangerous because storms can build in very short periods of time and when coupled with visibility restrictions can make mountain storms doubly dangerous. A pilot's ability to determine the size and magnitude of these thunderstorms can be reduced due to visibility restrictions in mountainous terrain.

Because the pilot lacks visual information, a pilot may try to circumnavigate what he or she believes to be an isolated cell. In reality, the "single cell" could turn out to be a squall line.

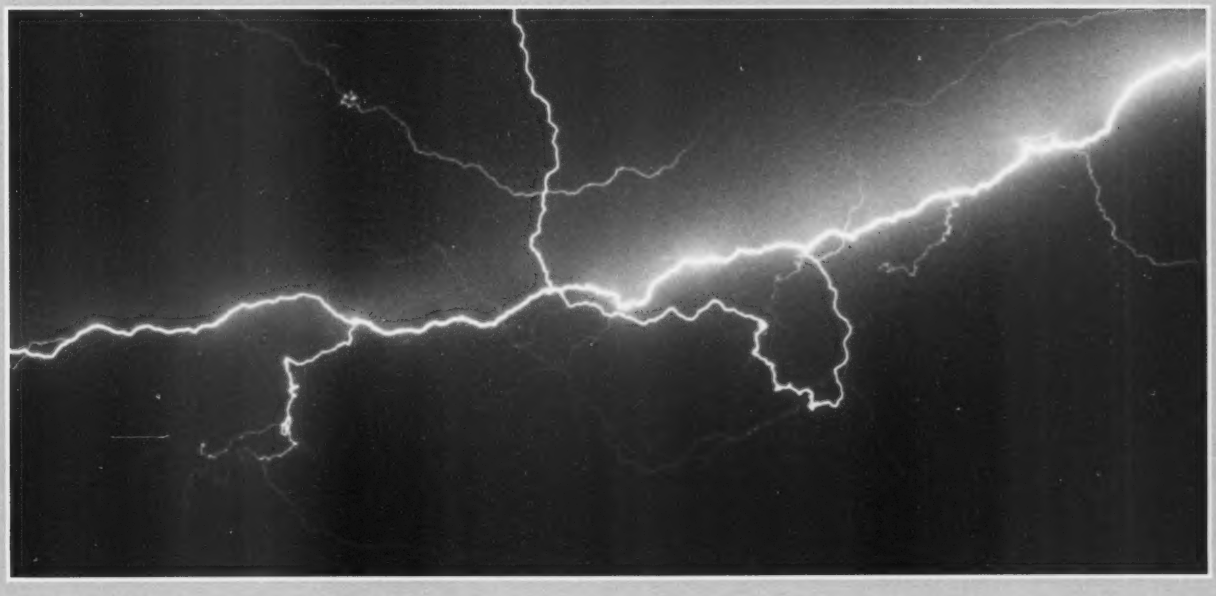
10. A severe form of down draft, found in thunderstorms of some magnitude, is frequently referred to as a downburst or microburst. This wind shear phenomenon is most dangerous to an aircraft when encountered on approach to landing in landing configuration. A pilot flying into a downburst will first notice a rapidly increasing headwind and a resulting increase in airspeed. As the wind shifts to an increase in tailwind, airspeed is lost and the aircraft begins to sink uncontrollably. Add to this an accumulation of rain on the airfoil, which can reduce lift not to mention an increase in gross weight because of the rain, and a pilot could be hard pressed to keep the aircraft's sink rate from increasing beyond its climb capability.

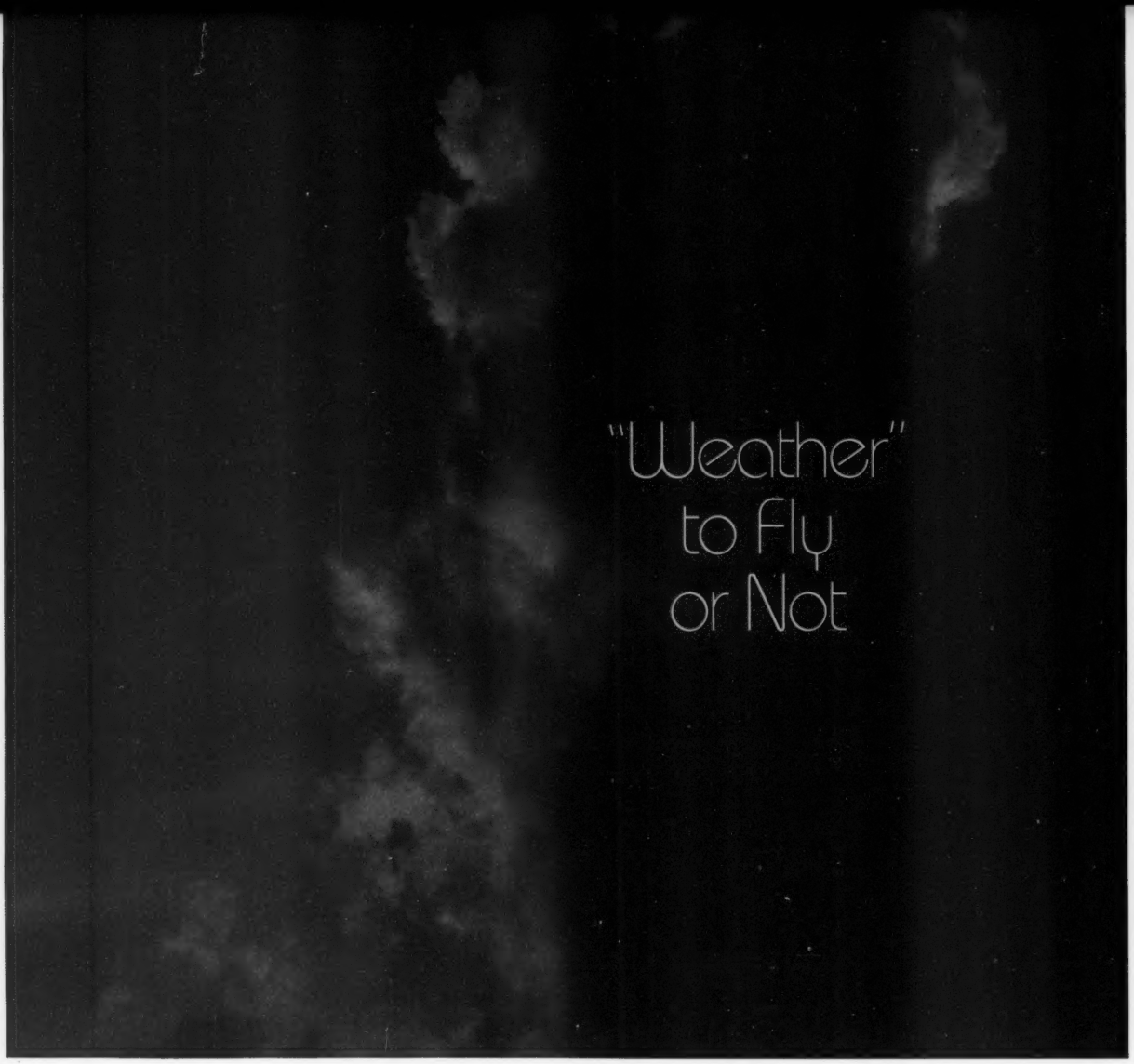
11. A squall line is a band of weather containing severe thunderstorms, and presents the single most intense hazard to aircraft. Thunderstorm cells can obscure mountain passes. Obscuration caused by rain showers and clouds in conjunction with down drafts contribute to aircraft accidents occurring in mountainous areas. Remember that the down draft is not always directly beneath the storm itself but can be felt miles away. A pilot experiencing turbulence before reaching the mountainous area to be crossed is almost assuredly going to feel the effects of that turbulence increased by channeling of air by mountain passes. Of course, mountain wave/rotor turbulence does not always require convective activity.

12. Single huge isolated thunderstorms are frequently seen in desert areas. These storms are capable of producing several inches of rain in a matter of minutes. Desert thunderstorms often times form in the summertime during the early evening hours. Desert dwellers refer to the season that produces these storms as the Monsoon Season. Isolated storms produced by surface heat rising, normally only last for a couple of hours before dissipating. Cloudbursts associated with these isolated storms, mix rain with sand and dirt lifted during the cumulus stage, causing the rain to appear muddy as it falls. Visibility is reduced quickly in such storms compounding the usual rain, turbulence, and associated hail that can cause aircraft structural damage and pilot disorientation.

13. Down drafts, created in the mature and dissipating stage of a thunderstorm, if severe, have the ability to push a plane into the terrain. This can be especially hazardous in mountainous areas where the land rises to meet you. Down drafts can be in excess of 2,500 feet a minute. Most light aircraft are not able to out climb down drafts of that magnitude. It has been said that the energy of a down draft is deflected away from the surface at about 50 feet, but I for one have never been brave enough to find out if the theory holds.

14. Hailstones falling from a thunder cloud, aside from the noise being deafening, can beat the leading edges of an aircraft into something unrecognizable. Dimpling caused by even small hailstones can interfere with lift being produced. Larger hailstones have the ability to destroy an aircraft both in the air and on the ground. Hail can grow to the size of golf balls and bigger and is made of solid ice. It is possible to experience hail from a thunderstorm anvil several miles away.





"Weather" to Fly or Not

by H. Dean Chamberlain, *Associate Editor*

This article could be titled, "How to check the weather when you can't see out of your window." Because we have readers with varying levels of experience, the previous article on the dangers of thunderstorms is timely, especially now that summer is here.This also seems like a good time to review weather resources available to all pilots.

Today, pilots have access to so much weather information that in some cases, some pilots may feel intimidated by the amount of information available. Others, in spite of the amount of information available, may never check the weather, although weather remains one of the primary causes of aviation accidents. The phrase "continued VFR flight into instrument meteorological conditions (IMC)" continues to appear in too many accident reports. Least we think only inexperienced VFR pilots are involved in most of the weather related accidents, in too many cases, instrument rated pilots who could have filed IFR do not and crash in either marginal VFR conditions or in IFR conditions just like their VFR counterparts. Scud running is an equal opportunity killer that does not respect ratings or experience.

Even air carrier aircraft are not immune from weather related accidents. Air carrier wind shear related accidents continue to make headlines.

Since all pilots and aircraft are vulnerable to weather related accidents, what can pilots do to identify such conditions? A review of weather and its reporting might be in order.

When was the last time you saw someone, other than a student pilot or a pilot preparing for a written test or a flight test, review a book on weather and how it is reported? And with the July 1996 METAR/TAF deadline approaching for the U.S. to change its weather reporting, are you ready for the change? For that matter, when was the last time you saw anyone reviewing

FAA Advisory Circulars AC 00–6A, *Aviation Weather;* AC 00–45D, *Aviation Weather Service;* or the *Aeronautical (*formerly *Airman's) Information Manual's* (AIM) section on weather? Maybe now is the time.

So how does one review the weather for a flight?

The first step may be watching your local TV meteorologist or your local weather channel to get an overview of the weather across the country and for your local area since many TV stations now have access to current National Weather Service radar and weather reports. A satellite image of your area can give you a pretty good idea of what kind of weather you might expect for your flight.

The next step is a call to either your local Flight Service Station (FSS) (1–800–WX–BRIEF) for a standard briefing or to contact one of the FAA-funded Direct User Access System (DUATS) computerized weather services for a detailed weather report for your area, route of flight, and destination. DUATS access does require a computer and modem. If you choose to call FSS, do you remember what a standard weather briefing is or what it contains? Do you know what an abbreviated briefing is and when it is appropriate? If not, it might be time to review the AIM. Important FSS and National Weather Service telephone numbers are listed in the FAA *Airport/Facilities Directory (*A/FD). The A/FD also lists FSS communication frequencies.

Many local airports and fixed base operators (FBO) provide access to DUATS or one of the commercial weather reporting sources that can provide all types of information including various weather charts. Some of these commercial services may be free. Other services, such as the various charts, may cost money. Most of the services allow you to use a credit card to pay for the expanded services.

All of these weather sources can help a pilot meet the requirement of FAR § 91.103, Preflight action, which says in part that for an IFR flight or a flight not in the vicinity of an airport, the PIC must become familiar with all available information concerning that flight including weather reports and forecasts.

The following are some of the severe weather terms used by the National Weather Service (NWS) and FAA to alert pilots such as Severe Weather Forecasts Alerts (AWW), Convective SIGMET's (WST), SIGMET's (WS), Center Weather Advisories (CWA), and AIRMET's (WA). The National Severe Storm Forecast Center in Kansas City, MO, issues Severe Weather Forecast Alerts and Severe Weather Bulletins as required.

According to the AIM, Convective SIGMET's in the U.S. concern only thunderstorms and related phenomena (tornadoes, heavy precipitation, hail, and high surface winds). They are issued for tornadoes, lines of thunderstorms, embedded thunderstorms, and thunderstorm areas greater than or equal to thunderstorm intensity level 4 with an area coverage of 4/10 or more over an area of at least 3,000 square miles. As the AIM states, "Since thunderstorms are the reason for issuing the WST, severe or greater turbulence, severe icing, and low-level wind shear (gust fronts, downbursts, microbursts, etc.) are implied and will not be specified in the advisory.

Pilots planning a flight can request the latest weather information from the weather services listed. This is also the time to verify the latest area forecasts and other reports including any NOTAMS applicable to the flight. But what can a pilot in flight do? One thing is to monitor in-flight weather information on the FAA's continuous Hazardous In-Flight Weather Advisory Service (HIWAS) which reports inflight dangerous weather.

FSS weather advisory broadcasts are also made on VOR's within the FSS's respective area. FSS broadcasts Severe Weather Forecast Alerts and Convective SIGMET's information upon receipt and at H+00, H+15, H+30, and H+45 for the first hour after it is issued. FSS broadcast SIGMET's, CWA's, and AIRMET's upon receipt and H+15 and H+30 minutes for the first hour. Air route traffic control centers (ARTCC) also broadcast alerts once when received. When FSS and ARTCC's broadcast a weather alert, they will refer to the type of alert and advise pilots to listen to HIWAS or how to obtain additional information. HIWAS is not a replacement for preflight, in-flight briefings, or Flight Watch services. Pilots can check the AIM and the A/FD for complete details on HIWAS and related enroute services

This article is only a very brief review of some of the weather services available to pilots. For more information, pilots can review the AIM, AC 00–6A, AC 00–45D, or one of the many texts or books written on weather. One of the best ways to learn more about weather or how to get a weather briefing is to visit a Flight Service Station and talk to a FSS weather briefer.

But the final choice as to "weather" or not you fly depends upon you, your judgement, your qualifications, and your type of aircraft. After all, you are PIC—with all of the responsibility that term conveys. ■

PART SIX

The Old Cap'n

by Dick Hague

As I was decanting a cup of FSDO coffee-and-taxiway-sealant, I was startled to espy the Old Cap'n heave himself, with injudicious haste, through the front door as he fled the cold and blustery afternoon. I sailed the half-full cup towards the HazMat bin, removed my shoes, and began to tip-toe towards the back door.

"Set your parking brake, Sonny," he bellowed. "Now, I know that you're not heading out for ramp surveillance cause the weather is too gnarly for you delicate FAA-types. And your shoes in your hands instead of on your feet tell me that you're trying to outflank the Old Cap'n. Now if *that's* true, you've got a choice to make: a wobble pump handle upside your head or," brandishing his umbrella, "this bumbershoot where . . . "

"Cap'n! Language!" I protested, getting his drift.

He fixed me with that famous, steely stare and said, "What's it going to be, then, Bucko?"

I remonstrated with him, "Cap'n, I'm shocked. Shocked, Sir." Morphing from guilt to indignation, I dared press on. "I was on my points because I'm preparing a tryout for the lead in Swan Lake." Armed with the pump handle and umbrella, he pressed forward.

"The lead in Swan Lake," he growled, "is for a ballerina. And you in a tutu would be about as appealing as having to fish a rhinestone out of a rhino's snout. So . . . " He advanced, wobble pump handle at 12 o'clock; the umbrella at six. "What th'. . . " The Old Cap'n stopped in mid-sentence, his eyes moving past me to the runway. "Hang on to your hat, boy. We've got us a situation developing out there."

I turned to see a local FBO's 172 touch down with a solo pilot at the controls. Moments later, the aircraft began to weather-cock into the 8-G-15-knot crosswind and drift inexorably towards the downwind edge of the runway. Narrowly missing the lights, the 172 bumped to an uneventful stop in the grass.

"Well, tether my bogeys to blades and call me Tonya. This lad is to flying what Raymond Burr is to the bar. Why, I've seen better directional control from a hummingbird in a hurricane. If this dodo wants to buy into the farming business that bad, he ought to buy it before he burrows in it."

The Old Cap'n and I looked ruefully at one another. Slowly shaking his silver-maned head, the Old Cap'n, mustachios trembling, softly ruminated, "The boy was lucky that time. I wonder if he and his CFI spent any time discussing hydroplaning?"

I nodded as we walked to my office, "You're right, Cap'n. Hydroplaning probably doesn't get the attention that it deserves. Of course, student pilots don't normally fly that much in weather like this . . . "

"Quit making excuses, Bub," he roared. "As long as pilots are able to leap vast expanses of real estate on a single tankful, they've got to know *everything* that could ruin their whole day. Like we saw just now."

The Old Captain settled himself into my chair and hoisted his left ankle to his right knee. "Lemme talk to you about hydroplaning, Sonny. What'd we just see? Normal touchdown on a damp runway. Crosswind at 8 gusting to 15. IAS 75 knots, give-or-take. He was probably looking at the first turn-off. He tapped the brakes. Nothing. Thinkin', 'Hmmm.' 68 IAS. He applied the brakes again. Still nothing. Now thinkin', 'Oops.' 57 IAS. Starting to drift. Now yellin' 'Waaaaa . . . . ' Any harder on those brakes and he'd have either fractured his femurs or left his heel tracks on the asphalt.

"If he was either able or in the mood to have looked at his wheels during his ride towards the weeds, he'd've seen that tire rotation had ceased in the *Ooops* and could even have been turning in the opposite direction during the *Waaaa*. He was hydroplaning, Sonny, and he didn't know what to do, and he didn't have time to break out the book and look it up 'cause he flat ran out of runway, directional control, and ideas at about the same time."

The Old Cap'n fumbled for his pipe, regarded the no smoking sign, and furiously jammed his briar back into the top of his cavalry boot. "Early research into hydroplaning, the phenomenon that occurs when water is trapped between the tire and the runway, indicated that the approximate hydroplaning speed equals nine times the square root of the tire pressure. That's a good ball park number. Sometimes.

"The *9 times* formula depends upon the condition of the tire *and* the phase of flight. On takeoff, for instance, when the tire is up to speed, the *9 times* applies. On landing, when the tire must spin up, tests have shown that hydroplaning can occur at 7.7 times the square root of the tire pressure."

He leaned towards me. "What does this mean to pilots, Sonny?" I opened my mouth to answer, but he continued. "Shut yer trap, Sonny. You catchin; flies? For openers, you might oughta reduce your personal Takeoff Safety Speed to the *nine times* formula when you're taking-off on a wet runway, and plan your approach and touchdown to stay off the brakes until your airspeed reads something less than 7.7 times the square root of the tire pressure.

"Let's look at that 172 settin' in the grass there as an example. With

the POH-recommended inflation; 29 psi on 6.00-6, 4-ply rated tires, the square root is approximately 5.5 times 9, or a takeoff hydroplaning speed of 50 knots. On landing, however, the tires are susceptible to hydroplaning at speeds at or greater than 42 knots. Also, you've got to know something about the runway. Is it grooved, crowned, or grooved and crowned? None of the above?" He plucked a silver hair from his head and drew it taut between his thumbs and forefingers. "A layer of water this thin can support hydroplaning. Is the runway clean or dirty, particularly in the touch-down zones? Light mist makes a runway covered with rubber and exhaust residue slippery to walk on, let alone to maintain directional control of your aircraft."

The Old Cap'n warmed to the subject, his words tumbling out quickly. "How much tread is left? The research was conducted using brand new, out-of-the-box tires. The FAA requirement for tires are: if it don't hold air, replace it. Flat Spots? Replace it. Running on slicks like the neighbor's kid? Replace it."

He leaned forward in his chair and gently laid a gnarled hand on my forearm. "Believe you me, Sonny, it's the hardest thing in the world, after landing on a wet runway, to stay off the binders. But stay off 'em you must until your speed decreases to the point that the tires are in contact with the runway; not skating on water. Now, let's you and me go on out there, buy that kid a cuppa real coffee—not that sludge that you trashed when you saw me comin'—and, while it's still fresh in his mind, talk some."

As the door to the FSDO silently closed behind us, the Old Cap'n loaded and lit his pipe. He took a contented puff. "Ahhh. Better. Y'know, Sprout, the bottom line here is, when this junior bird man first recognized that he had a problem, he oughta have been thinking *Go Around* instead of becoming a passenger with the control wheel in one hand and an E Ticket in the other. It goes right back to what I been talking about since Day One: Situational Awareness. Constantly evaluating and reevaluating your options. Knowing that, when something doesn't look right, smell right, sound right, or feel right, it's time to go to plan B; that pre-determined course of action that'll get you back to a safe position. Your Comfort Zone. Next time you fly with a pro, watch him. Might seem like most of the time, he's settin' over there daydreaming. Not so. He's constantly defining and redefining his options every second between the time he gets his weather briefing right up to when he closes his flight plan."

As we neared the Cessna, the pilot, spotting my FAA name tag, avoided our eyes. The Old Cap'n smiled, "Glad to see that you're okay, Sonny. My name's 'The Old Cap'n'. I imagine you know yours. Now, let's us visit some as soon as," turning to give me a broad wink, "we get this FAA fella here on back to his office."

As I'd learned from the Cap'n, I about-faced abruptly and began the walk to the FSDO. Halfway back I stopped, thinking, "Wait a minute. Talking to that guy is my job." I turned back toward the 172 and peered through the mist to see the young man deep in conversation with a shadowy figure who looked familiar. I thought I saw an arm wave at me, and a voice echoed in my head, "Git along, now. And keep the blue side up, Kiddo. See you next time."

I resumed my walk back to the office. The kid was in good hands. ■

Seaplane Water Survival

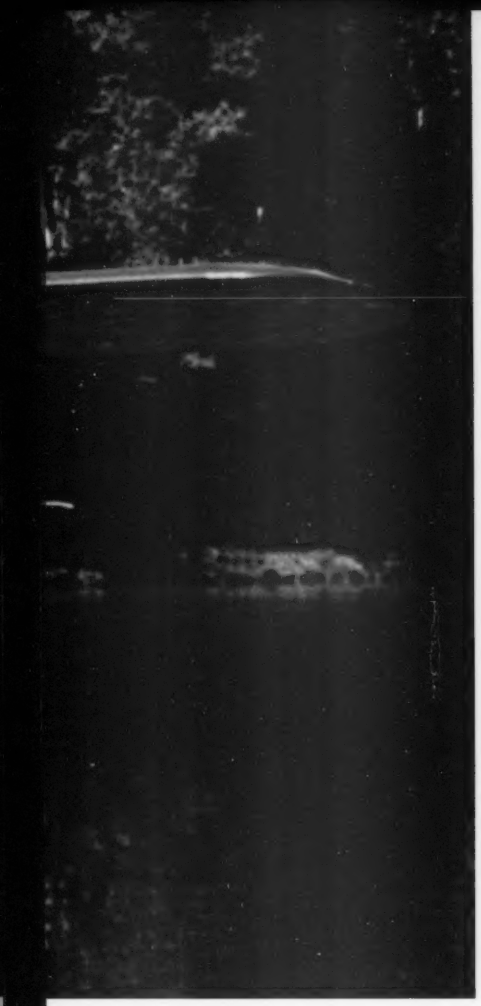
by H. Dean Chamberlain, *Associate Editor*

As a safety publication, *FAA Aviation News* is always interested in safety reports that highlight a particular problem or type of aircraft operation, especially if the subject has a personal connection. This is one of those cases. As a rookie seaplane pilot (both single and multiengine rated) and a scuba diver, I found the Transportation Safety Board (TSB) of Canada report discussed in this article particularly interesting because it addressed an issue that many civilian pilots and passengers may not think about very often.

That issue is water survival after a seaplane or any type aircraft accident offshore. Although civilian pilots may not often think about water survival, this is an important subject for military, sea-services flight crews (both fixed-wing and helicopter) and others involved in offshore flight operations. This subject is so important that the Navy and Marine Corps have developed special cockpit and cabin water training devices that simulate water crash scenarios such as an inverted aircraft under water.

Aircrews and troops are taught how to exit simulated aircraft cockpits or cabins under visual and non-visual conditions after the training device impacts the water and is turned upside down to "help" disorientate the "crash victims." In such cases the students learn, as do scuba students, that in certain situations the only way someone can tell which way is up is by rising air bubbles. Knowing which way is up is important because in a submersed aircraft, car, or boat the crew and passengers may have to go down to go up. People have drowned trying to get out up through the "bottom" of an inverted aircraft when they could have exited to safety *down* through a hatch or window below them.

The problem is knowing which way is up and which way is down and where the nearest hatch, window, door,



or exit is located in reference to your aircraft seat. It also means being able to locate your escape exit in the dark while under ice-cold water after the trauma of a crash. Throw in the fact you might be injured, and you have an idea of the kinds of problems you might face if your aircraft capsizes after a crash. This is the type of survival training given by the military to its aircrews and which might have saved some of the victims mentioned in this Canadian safety report if they had gone through such training or thought about such training. [FAA Advisory Circular (AC) 91–69, "Seaplane Safety for FAR Part 91 Operators," provides many important safety tips for seaplane operators, including information on water survival, hypothermia, and personal flotation gear.]

A press release accompanying the formal Canadian report said that the Transportation Safety Board of Canada made six aviation safety recommendations in its report titled, *A Safety Study of Survivability in Seaplane Accidents*. [Editor's Note: The Transportation Safety Board of Canada is similar to the U.S. National Transportation Safety Board (NTSB), and its recommendations, in this case, were forwarded to Transport Canada which is like our Department of Transportation. We have printed the report's recommendations because of the valuable information contained in them.]

The Canadian safety study analyzed the investigation results of 103 fatal seaplane accidents in Canada between 1975 and 1990, where the flight terminated in the water. Of the total of 276 persons on board those aircraft, including pilots and passengers, 168 perished.

The TSB study found that relatively few of the deaths in these seaplane accidents occurred during the impact sequence. In fact, the majority of those who died perished as a result of post-impact drowning, and most of these drownings occurred inside the cabin of the aircraft.

Those who survived these accidents often encountered difficulties in exiting the aircraft because of damage to the structure of the aircraft, difficulty in reaching exits, and difficulty in opening doors once they reached the exits. A large proportion of those who died outside the aircraft drowned; most were not wearing life jackets.

Occupants of seaplanes in accidents on the water are vulnerable to drowning, and in most cases personal flotation devices are not readily available after impact. The TSB therefore recommended that:

1. Transport Canada require that all occupants of seaplanes wear a personal flotation device during the standing, taxiing, takeoff, and approach and landing phases of flight.

Although the majority of these fatal seaplane accidents involve drowning, approximately 10 per cent of these victims were incapacitated from non-fatal impact forces. There have been a number of previous safety studies and safety recommendations concerning the availability and use of lap belts and shoulder harnesses that could reduce the severity of impact forces and facilitate egress for the occupants. The TSB therefore recommended that:

2. Transport Canada require the installation of lap belts and shoulder harnesses in seaplanes and require their use by all pilots during takeoffs and landings before the 1995 season begins.

The TSB analysis of the accident record draws into question the attitude of some seaplane pilots towards basic safety measures. The TSB recognizes that, alone, more stringent regulations or enforcement of those regulations will not alter current behavior patterns. Nevertheless, in view of the continuing disregard for basic safety provisions by many operators and pilots in seaplane operations, the TSB recommended that:

3. Transport Canada implement a national safety awareness program, promoting the use of personal restraint systems and personal flotation devices in seaplane operations as soon as practicable. Transport Canada also investigated options for imposing strong sanctions on owners and operators who flagrantly disregard the basic tenets of safety in seaplane operations and will make public its findings.

Many of the passengers of the accident aircraft were not experienced in seaplane operations. They were unfamiliar with the aircraft, personal restraint systems, life-support equipment, emergency egress routes, etc. These passengers would have benefited from a pre-flight briefing before takeoff or landing on water. A recommendation for such briefings was made in a 1988 Canadian Aviation Safety Board (CASB) study, but, regrettably, the recommendation has not been satisfactorily implemented. In order to improve the survival of passengers in the event of a seaplane accident the Board has recommended that:

4. Transport Canada establish and promote specific pre-flight briefing requirements for passengers for commercial seaplane operations from or to water.

In its formal report, the TSB reported, "Of the 168 occupants (including pilots and passengers) who died in the 103 accidents known to terminate in the water, 118 (70%) were located inside the aircraft, 37 (22%) were located outside the aircraft, and three (2%) were found onshore. (In 10 cases (6%), the location of the body was not recorded.) Half of the occupants drowned while trapped in the confines of the cabin. Of the 63 pilots who died, 49 (78%) were located inside the aircraft, 10 (16%) were located outside the aircraft, and one (2%) was found onshore. [In three cases (5%), the location of the body was not recorded.]"

Table 1 indicates that less than 10% of the 276 occupants escaped unhampered from the aircraft cabin.

In reviewing the report, we thought several comments were significant.

"The aircraft fuselage often buckled during impact, bending doors and door-opening mechanisms. Aircraft sometimes flipped upside-down, making it difficult to maintain situational awareness. The flaps, which are at least partially lowered on most aircraft during takeoffs and landings, may have prevented egress through outward-opening exits. Disoriented occupants may have panicked as icy cold water rushed into the cabin in the seconds following impact. Some of the aircraft involved in water-impact accidents did not have a rear exit, making evacuation for the rear-seat passengers difficult. In these cases, the only egress route for passengers would have been to crawl over the front seats and through the crew door(s). Actuating a simple door-opening mechanism can become an almost impossible task in cold, dark water when the aircraft cabin is vertical or upside-down. This may be compounded by the fact that the opening mechanism of some doors is not so simple (with more than one handle or lever to actuate) and few are standard.

"A 1988 study conducted by the Canadian Aviation Safety Board (CASB) cited eight occurrences in which the occupants exited the aircraft successfully but drowned attempting to swim to shore. The report found evidence that 'occupants sometimes drown while attempting to reach life jackets stowed in the rear of the cabin or under seats. Often the aircraft became inverted in the water, suspended by the floats. The occupants then swam to the surface whereupon one would dive back to the aircraft to retrieve the life jackets.'

"The causes of death for the 168 fatalities (including pilots and passengers) from accidents which occurred on the water fell into four major categories as follows: 18 (11%) of the deaths occurred during impact; 17 (10%) of the occupants were incapacitated from non-fatal impact forces and subsequently drowned; 42 (67%) died from drowning; and one pilot (2%) died from exposure. [In 17 cases (10%) the cause of death was not recorded.]"

The report notes the lack of knowledge of many on how to exit an inverted aircraft after a water crash and the fact many pilots and passengers fail to wear, or even have, shoulder harnesses that might minimize impact incapacitation in survivable crashes and thereby reduce the risk of drowning. The report said some pilots don't even wear seatbelts for a fear of being trapped in their aircraft.

The report noted the need for everyone to wear proper personal flotation devices during critical phases of flight such as takeoff and landing.

And the importance of properly securing cargo and other objects in an aircraft was also noted. Many of these suggestions are important in any type of aircraft. And many of the TSB's recommendations apply to cars, boats, and other vehicles operated near water, as well as for aircraft.

It is important to remember that what may be a *survivable* accident on land may become a drowning on water. The keys to the successful outcome of any survivable situation include proper training and preparation, a plan of action, good equipment, presence of mind, situational awareness of both your environment and your own physical limitations, and the most important item any person in a survival situation needs—the will to live.

Finally, once you survive any type of emergency such as a water crash, it helps to have help coming to your rescue. Every pilot should always file some type of flight plan. Boaters should leave a float plan with a responsible person. And other travelers such as hikers should leave some kind of travel plan with a route and expected arrival time listed with a responsible person who can send help in case the traveler fails to arrive at destination at the designated time of arrival. Safe traveling. ■

Readers interested in obtaining additional information about the report, "Safety Study of Survivability in Seaplane Accidents," can contact the Transportation Safety Board of Canada's Public Affairs at (819) 994–8053 or (819) 953–7812. Readers wanting a copy of FAA AC 91–69 can request a copy by writing to the U.S. Department of Transportation, General Services Section, M–45, Washington, DC 20590. The Section's FAX number is (202) 366–2795. For a complete listing of all FAA advisory circulars, you should ask for a copy of AC 00–2.8 Advisory Circular Checklist.

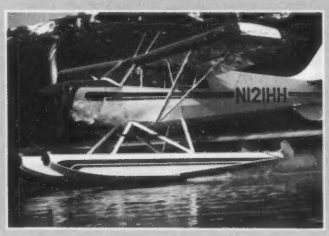


Table 1
Occupant Egress
(276 Occupants)

Escaped unhampered	23	(8%)
Escaped with difficulty	72	(26%)
Did not escape	121	(44%)
Undetermined	44	(16%)
No information recorded	16	(6%)

Things That Keep You Afloat

by H. Dean Chamberlain
Associate Editor

In the old days, people called them life jackets. Today, many people, including the U.S. Coast Guard, call them personal flotation devices or PFD's. If you haven't been in a boat store recently, today, PFD's come in all shapes, sizes, colors, and styles. And with the development of small, fast, jet-ski boats, some PFD's now come with impact ratings measured in miles per hours, such as a 50 MPH vest.

Does all of this development mean all PFD's are good for, or even approved for aircraft use. Sorry, the answer is no.

Although there are more PFD types and styles available today than ever before including both Coast Guard approved and non-approved PFD's, such devices may not be FAA-approved for required aircraft use. Pilots can check the FAR for those types of operations that require FAA-approved flotation devices. Even if not required by the FAR, wise pilots will carry FAA-approved PFD when operating beyond gliding distance to shore which is defined as that ground above the high water mark.

Although some will argue that any PFD is better than none at all, FAA-approved aviation PFD's are designed to satisfy a unique aviation need. Adding to the confusion is the fact that the Coast Guard normally does not allow FAA-approved inflatable aircraft life vests to be used to meet maritime requirements. Sound confusing? It is.

The reason is the different safety requirements for each environment. In the marine environment, a PFD is designed to keep someone afloat who has either been washed or fallen overboard or who is abandoning ship. In this environment, flotation is the most important element. Hence, most Coast Guard PFD's have built-in flotation, and some can be very bulky such as a Type I PFD which provides the most protection for a person in the water.

Compactness and being able to escape from a crashed aircraft are not prime considerations for maritime use.

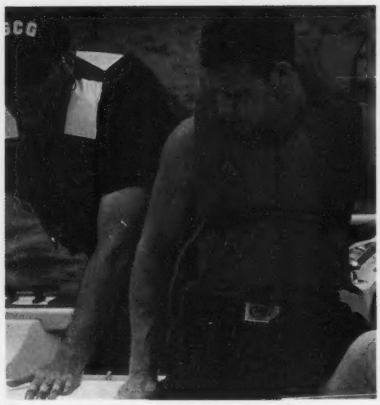
As the Canadian report (page 10) pointed out, aircraft water crashes put demands on life vests, life jackets, life preservers, or individual flotation devices, as the FAR call them in various sections, that are not necessary requirements for maritime needs. Most Coast Guard-approved PFD's, including some of the new flotation jackets, have some type of built-in flotation, and most are normally bulky. These types of PFD's could trap someone in an aircraft either because of the built-in flotation or bulkiness or both. The built-in flotation could keep you from moving or swimming down inside a water-filled aircraft to find an exit, and the PFD's bulkiness could keep you from exiting through a window or partially opened door.

The same is true of some of the new automatic-inflating inflatable PFD's or hybrid PFD's (part built-in flotation and part inflatable) being seen more and more around the water. Many of which are not Coast Guard approved as of yet. Although the automatic inflating vests are not as bulky as a regular PFD, and therefore are less restrictive to the wearer when deflated, most maritime inflatable PFD's are designed to inflate automatically when immersed in water. If the wearer is trapped in a submerged aircraft when the PFD inflates, that person could be prevented from getting out of the aircraft just as if the wearer was wearing a regular PFD. Or worst, the wearer could snag the inflated PFD and put a hole in it while exiting the aircraft. Now the wearer has no, or little, flotation. The potential loss of air in inflatable PFD's is one reason the Coast Guard has been reluctant in approving inflatable PFD's for maritime use.

All of which leads to our discussion of FAA-approved life preservers, commonly referred to as life vests or life jackets, and individual flotation devices. For consistency, we will continue calling such devices PFD's.

There are two technical standard orders (TSO) to which FAA certificates PFD's for aircraft use. One is **TSO-C13f, Life Preservers** designed for air carrier use. The other is TSO-C72c, Individual Flotation Devices. The primary differences between the two TSO's is the amount of buoyancy provided and the number of categories listed in each TSO, and the regulations under which each is authorized for use.

TSO-C13f Type I, Inflatable, and Type II, Noninflatable, life preservers provide for four categories of preserver buoyancy ranging from 20 pounds of



U.S.C.G

These two common types of marine personal flotation devices (PFD) are typical of those found on many boats. The vest style on the left is designed to provide freedom of movement and to support a conscious person in the water. The PFD on the right is designed to float someone face up on the water. Both styles could trap someone in a submerged aircraft because of their built-in buoyancy. Pilots should use only FAA-approved PFD in their aircraft.

H. Dean Chamberlain

". . . today, PFD's come in all shapes, sizes, colors, and styles." West Marine, Alexandria, VA

buoyancy for an infant/small child to 35 pounds of support for an adult. TSO-C13f requires a survivor locator light that meets TSO-C85.

By contrast, TSO-C72c only provides a minimum of 14 pounds of buoyancy for either of its two types of devices, inflatable or noninflatable devices.

Under both TSO's, a non-inflatable device can be a seat cushion, headrest, armrest, pillow, or similar aircraft equipment.

What makes FAA-approved inflatable PFD's different from maritime PFD's is that aviation PFD's are manually activated, self-inflating, and designed and tested for easy donning. Like most inflatables, FAA-approved PFD's can also be manually inflated by the wearer blowing air into special oral inflation tubes. Under TSO-C13f, FAA-approved life preservers may have either one or two independent flotation chambers. Separate chambers provide redundancy in case one chamber is damaged or develops a leak.

Like other FAA-approved emergency devices, aviation PFD's require periodic inspection to maintain their airworthiness certification.

And like the old aviation saw about altitude above you and runway behind you and fuel left behind, any emergency device such as a PFD that is not readily available to a user, or is available to a user who doesn't know how to use it is almost like having no device at all.

No discussion about water safety would be complete without saying that probably the next best thing to having a TSO'd PFD on if you find yourself in the water other than a bath tub is having a properly equipped, TSO'd life raft nearby. Both can improve an otherwise bad day.

But both may be worthless if a pilot or passengers don't know how to use them under the worst possible conditions. If you fly around water a lot, you might want to practice using your safety gear. For a good drill, you can try exiting your aircraft in a specified amount of time at night with your eyes shut after donning your PFD. You might be surprised to find you have a problem putting on your PFD or getting out of your aircraft. If you have a problem donning your PFD, you might want to put it on before you takeoff. It is just one less thing to have to think about in case of a problem over water.

In your drill did you use your checklist and unlock your door or doors before impact? Did you think about what you would do if the aircraft filled with water before you can get out? Have you thought about how your rear passengers would exit in case of an accident? Have you thought about how many door locks have to be released to exit your aircraft? Do your passengers know how to open your aircraft's doors or exits? These are just some of the things you should consider at all times, but especially when operating on or near water. Do you give your passengers a safety brief before takeoff? What about other pilots flying with you?

One final thought, how would you like to do a free, test of your inflatable emergency gear? You can. Just check the inspection date for the item and when you have to have it re-inspected anyway, test it. You might be surprised how it works. The best thing is the test is free if you would have had to pay for replacing the items used in the test such as the gas cylinder, etc. during the inspection. You might want to check with the company or inspector doing the inspection before you test the device just to be sure of the replaceable items. Even if you might have to pay a small fee for testing the item, it might be money well spent. So go ahead, do a live drill and pull the inflation handle just to see what happens. Someday you might be glad you did.

And if you are really adventuresome, take a scuba course to learn how to function underwater. It is a different world beneath the surface. But if you do become scuba certified, please learn, practice, and obey all safety rules for diving and flying.

We hope you have a safe summer of flying. ■

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Rod Shelburne of Ogallala, NE, and his Ag Rescue I.

AG RESCUE I

by Larry Craig

Aviation is only the sum of all the people involved with it, from the kid pumping gas to earn flight hours to the highest paid airline captain; the part-time flight instructor to the flight attendant. Because of the Aviation Safety Program's grassroots contact with all levels of aviation through its counselor program, we get to hear about a lot of the everyday people who contribute to aviation. Periodically, we will profile them in the magazine. Please feel free to submit a write-up about some interesting person in aviation in your area. The criteria is that the person have an interest in aviation of any nature and a story that would be interesting to the rest of us. Color pictures or slides accompanying the article are helpful. If you don't feel up to writing about the person, contact your local Safety Program Manager and ask him or her for a hand, or give us a call at (202) 267–8017. We look forward to hearing about lots of "People in Aviation."—Editor.

One of the interesting and very enjoyable aspects of being a Safety Program Manager is working with the cadre of appointed Aviation Safety Counselors (formerly Accident Prevention Counselors) in my area. Observing the creative approaches to aviation safety these counselors take is really educational.

Let me tell you how one such counselor, Mr. Rod Shelburne of Ogallala, NE, has been working with fire departments and rescue organizations to train them how to more effectively cope with an aerial applicator aircraft accident.

Rod is an aerial applicator himself and a board member of the Nebraska Aviation Trades Association (NATA), the state agricultural aviation association. Rod is a designated safety officer at "Operation SAFE" clinics, where aerial applicators fly to have the accuracy of their swath runs tested. Rod is also able to talk to fire department and rescue people on their level of expertise since he is a long-time volunteer fireman and a fully qualified emergency medical technician (EMT).

I first became aware of what Rod was doing when I attended the annual NATA convention in Kearney, NE. I spotted this odd-looking thing in the convention display area that looked like it might have something to do with an airplane. Rod was standing next to it, so I asked him what in the world it was. He said, "This is my Ag Rescue I." Of course, my next question was, "What do you do with it?"

Ag Rescue I is a fuselage of a Piper PA-25 *Pawnee* that Rod had salvaged from an accident. He put wheels on it, hitched it to a vehicle (ground-based), and began traveling around with it to fire departments and rescue units to talk to them about how to handle an aerial applicator aircraft accident.

Rod said, "There is a great demand for knowledge about aircraft from fire and rescue personnel because most of them have never been close to a light aircraft. For example, they have no idea how the doors or restraint systems work, where the fuel tanks are located, or where the battery is and how to disconnect it." This is just the tip of the iceberg of the numerous items of information he covers during his presentation.

Once the word got out among rescue units about his traveling road show, the demand has been overwhelming. "I usually wear out two sets

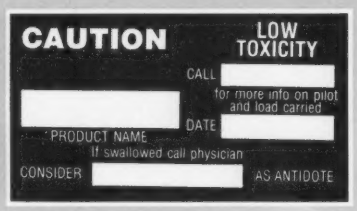
Aviation Safety Counselors

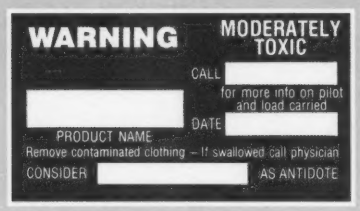
Each Safety Program Manager has a cadre of appointed Aviation Safety Counselors to assist in the many functions of the Aviation Safety Program (formerly the Accident Prevention Program). Aviation Safety Counselors serve voluntarily and are selected on the basis of their keen interest in aviation safety, their knowledge of local aviation activities, and the public respect they have gained through their professional abilities. Counselors do not necessarily have to be a pilot or a mechanic and can be anyone who brings a unique talent to the Aviation Safety Program. Contact your local Safety Program Manager; there's always room for more counselors.

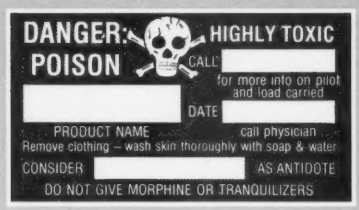
Micki Stickers

These 2½" by 4" peel-off stickers come in three colors: A green Caution for Low Toxicity; an orange Warning for Moderately Toxic; and a red Danger: Poison for highly toxic—complete with skull and crossbones. Each sticker has a space to write in the product's name, the date of the application, the possible antidote, and a number to call for more information on the load carried and the pilot. The Moderately Toxic and Danger: Poison stickers contain additional instructions, such as, "Remove contaminated clothing" and "Do not give morphine or tranquilizers."

If you are interested in obtaining some "Micki Stickers" contact the State of Nebraska Department of Aeronautics at (402) 471–2371 or write to Micki Stickers, Dept. of Aeronautics, P. O. Box 82088, Lincoln, NE 68501 and indicate the color sticker and the amount you want (quantities of five—5, 10, 15, 25).







of tires mounted on the fuselage during the winter months," Rod said. But one of the side benefits gained from this is "the favorable publicity towards aerial applicators" generated by his visits.

As Rod was explaining this to me, he pulled a handle on the fuselage and the whole door came off, an emergency egress system common on ag aircraft. Rod emphasized, "Today's aerial applicators are very professional," and that safety is continually emphasized. He continued, "But if I am in an accident, I would really like to have the rescue people know about this emergency egress door system."

"Another area of concern," he said, "is if the aircraft was upside down, and I was hanging from my restraint system, I wouldn't want anybody to cut me loose or to use the quick release system unless there was someone there to support me." Rod says its very easy for a rescue crew to do just that, dropping the poor pilot on his or her head, possibly breaking a neck in the process.

"Another example," Rod said, "is that rescue personnel should know where the battery is and how to disconnect it to prevent an electrical fire or an explosion from spilled fuel."

Rod pointed out that rescue personnel are very concerned about approaching an ag aircraft accident site because of the fear of contamination from a chemical spill. Most rescue personnel he said, "are not familiar with the use of the 'Micki Sticker.'"

"A what?"

"A 'Micki Sticker.' It's a pesticide information decal that the ag pilot can complete and stick on the side of his or her helmet." (See top of this page)

The "Micki Sticker" is named after Nebraska Department of Aeronautics employee, Ms. Micki Sayers who thought it up. The system is widely used by aerial applicators throughout the U.S. The sticker can alert a rescue crew on which type of chemical spill they have to deal with.

Rod said, "Rescue personnel are under the impression that ag aircraft carry a full load of concentrated chemicals. They are surprised to learn that the load is very diluted—anywhere from several ounces to 25 gallons of ingredient per 100 gallons of water."

Rod is also working with the Nebraska Fire Marshal's Training Division to incorporate aircraft accident training in the state fire marshal's program. Inclusion of such items in that training as basic aircraft structure, aircraft safety, pesticide recognition, personnel protection equipment, on-scene safety, and how local aerial applicators can educate and assist rescue personnel, Rod believes will expedite the removal of accident victims and increase the probability of their survival.

When I was at the NATA convention, I was very pleased to see the South Dakota Agricultural Aviation Association present Rod with a plaque honoring him for his efforts in working with rescue personnel in their state. I think you can see it was a recognition that was richly deserved. ■

Larry Craig is the Safety Program Manager (formerly Accident Prevention Program Manager) at the FAA's Lincoln, NE, FSDO. He would like to credit Ms. Rochelle Hansen of AG-Land Aviation in Grant, NE for providing input for this article.

Oshkosh '95

by H. Dean Chamberlain, *Associate Editor*

The FAA NOTAM for the 1995 Experimental Aircraft Association (EAA) Convention and Fly-In has been released. The "Oshkosh '95" NOTAM outlines the special air traffic control (ATC) operating procedures for all aircraft flying to or from the Oshkosh, WI, area during the dates of the Convention. The special ATC procedures for the Oshkosh area are effective from July 25 through August 2, 1995. Pilots must contact their local flight service station (FSS) or other NOTAM source for complete Oshkosh NOTAM information and to obtain a copy of the NOTAM. The following safety extracts provide an overview of the more common operating procedures and general safety procedures, but pilots need to review the NOTAM for complete information.

The NOTAM has specific instructions for various types of aircraft, such as warbirds, ultralights, helicopters, seaplanes, and aircraft with and without radios. Due to the expected volume of air traffic in the Oshkosh area, all pilots planning to fly to the convention need to review the NOTAM and become very familiar with its procedures before they enter the area.

Once at Oshkosh, pilots can visit the FSS office in the FAA Safety Center building—located near the control tower on the Convention grounds—for complete departure information when they stop to obtain their departure briefing and to file their flight plans. Pilots are also encouraged to visit the FAA Flight Standards Services Aviation Safety Program seminars and FAA displays in the Safety Center.

The FAA's goal during the Convention is the safe arrival and departure of all airmen, aircraft, and visitors. The following safety procedures are some of those listed in the NOTAM that will help ensure the safety of all at Oshkosh.

En Route Safety Alerts

Chicago O'Hare Class B Airspace now extends up to 10,000 feet MSL.

IFR aircraft operating below 14,000 feet MSL shall not file flight plans through Chicago Approach Control (ORD) airspace. An acceptable routing around ORD is JVL, V128, IKK, V144, MAPPS, V156, GIJ.

Wittman Regional Airport Director's Special Notice

1. Light aircraft (under 6,250 lb.) will be required to exit runways onto turf areas as soon as practical. Be alert and use caution for hazards marked with cones and/or flags. All movement on other than paved runways and taxiways is at pilot's own risk. All mishaps, incidents, or accidents must be reported to the FAA's Flight Standards District Office (FSDO), NTSB, a sheriff's deputy, or Wittman Regional Airport personnel.
2. Be alert for taxiing aircraft in all aircraft parking areas.
3. For safety purposes, absolutely no running engines or taxiing will be permitted during hours of airport closures.
4. Pedestrians are strictly forbidden on paved runways, taxiways, and the air carrier ramp at all times. Do no walk across runways.
5. Observe all fire prevention rules. No campfires or stoves are permitted near aircraft.
6. Contact law enforcement or Wittman Regional Airport personnel with any airport safety related questions.
7. Aircraft landing during peak saturation periods may be asked to depart if no parking spaces are available.
8. New taxiways have been constructed. Watch for white or orange runway threshold markings.
9. Bicycles and motorcycles are forbidden in the airport movement area.
10. Absolutely no alcoholic beverages are permitted outside the terminal building.
11. Contact the FBO for hard surface parking and fueling information. Basler's telephone number is (414) 236–7827. Unicom 122.95 MHz.

Airport Closure

1. Wittman Regional Airport will be closed to all arriving aircraft from 8:30 p.m. CDT until 7:00 a.m. CDT daily.
2. Wittman Regional Airport will be closed to all departing aircraft from 8:30 p.m. CDT until 5:30 a.m. CDT daily.
3. The airport will be closed periodically due to parking saturation and aerobatic demonstrations.
4. Arrivals and departures are not permitted during periods of aerobatic demonstrations.
5. No aircraft movements are permitted during airport closures unless prior permission has been granted by the Wittman Regional airport management. For permission, you can contact the Airport Director, Wittman Regional Airport, 525 20th Avenue, Oshkosh, WI 54901. Telephone (414) 424–0092.
6. Runways 4/22 and 13/31 will be closed to landing and takeoffs at least seven days before and during the EAA Convention. Do not takeoff or land on Runways 4/22 or 13/31.

Reduced Arrival and Departure Separation Standards

A waiver has been issued reducing arrival and departure separation standards for Category 1 and 2 aircraft (primarily single engine and light twin engine aircraft). Departing pilots are reminded to monitor FAA frequencies for departure instructions. Departures off Runway 9/27 are to monitor 121.75 MHz. Departures off Runway 18L/R or Runway 36L/R are to monitor 118.9 MHz.

VFR Special Traffic Management Program

VFR Crossing of Lake Michigan

Pilots planning to fly across Lake Michigan to or from Oshkosh VFR should plan on flying at least 4,000 feet AGL (approximately 4,600 feet MSL) to ensure adequate emergency radio reception on 121.5 MHz. At altitudes lower than 4,000 feet AGL there are significant areas of the lake without good radio reception. At or above 4,000 feet AGL reception is almost complete over the entire lake.

Pilots flying over Lake Michigan are encouraged to use the Lake Reporting Service to aid search efforts in the event of a water ditching. Details are listed in the NOTAM.

VFR Arrival Procedures for Radio-equipped Aircraft

1. All aircraft must use the VFR arrival procedures. Remain clear of all depicted high density traffic areas.
2. Obtain ATIS on 125.9 MHz before 35 miles from Oshkosh.
3. Monitor Oshkosh approach on 120.7 MHz before turning inbound over Ripon.
4. Enter transition over Ripon.
5. Proceed single file via the railroad tracks toward FISK.
6. All traffic shall maintain 90 knots and 1,800 feet MSL. If unable, maintain 135 knots and 2,300 feet MSL.
7. Listen for controller instruction as you approach FISK, "traffic to follow, etc." Controller will use color and type of aircraft at FISK. [FISK can be identified by railroad track/road intersection, large granary, white strobe lights, and controller staff at mobile trailer on hill north of town.]
8. Pilots should vigorously rock their wings to acknowledge ATC instructions, and refrain from verbal responses unless requested.

No-radio (NORDO) Aircraft

Pilots planning on flying into Wittman Regional Airport during the convention period without an operating two-way radio are required to print/type their name, aircraft type, aircraft color, aircraft identification number, address, and include the word "NORDO" with their signature on a post card and mail the card to:

EAA Aviation Center
P.O. Box 3086
Oshkosh, WI 54903–3086
Attn: NORDO Aircraft Procedures

Postcards must be received no later than July 12, 1995. You will receive an authorization and NORDO card. Place the NORDO card in the windshield of the aircraft when you land at Oshkosh to indicate to the EAA flagpersons or FAA controllers your intentions to taxi to parking or taxi for takeoff. The authorization returned to you will be your

ATC authorization to arrive and depart Wittman Regional Airport without a radio.

The postcard indicates that you have read and understand all the procedures contained in the "1995 Experimental Aircraft Association Convention and Fly-In" NOTAM. Pilots have the responsibility to pickup the NOTAM. Pilots are required to carry their no-radio authorization card with them. No-radio operations are strongly discouraged due to the heavy volume of traffic. Postcards will be returned with FAA approval. Call (414) 426–4800 if your approval is not received in a reasonable amount of time.

No-radio Arrivals

No-radio aircraft must use Runways 18L/36R as the primary runways (or when traffic dictates Runways 18R/36L). The use of any other runways because of extreme wind conditions requires prior approval by Oshkosh Tower (414–424–8000). Be alert for glider, rotorcraft, and ultralight operations on the southwest corner of the airport (west of Runways 18R/36L) from sunrise to 0900 and 1830 to 2015 hours CDT. Use extreme caution if there has been any rain within the previous 24 hours.

No radio arrivals landing Runway 18L/36R, do not cross Runway 18R/36L, until receiving a clearance from an FAA controller wearing a pink shirt/vest.

No radio arrivals are prohibited after 1100 hours CDT daily from July 25 through August 2, 1995.

Do not make an approach to, or land on, any runway when strobe light flashers on top of control tower are operating. Remain well clear of all departure courses and final approach courses until strobe lights are turned off.

Display NORDO card in windshield after landing.

No-radio (NORDO) Special Notice

ATC authorization for NORDO operations is based upon the following conditions:

1. Weather minimums of a ceiling of at least 1,500 feet and visibility of 5 miles or better.
2. This authorization is NOT valid if the flashing white strobes or airport rotating beacon, located on top of the control tower, is illuminated. These lights indicate an emergency, accident, or other traffic conditions exist which preclude no-radio operations. If these lights are on, remain clear of the Class D airspace. When the situation is resolved, the lights will be turned off and no-radio operations will resume in accordance with this authorization.
3. Pilots must exercise extreme caution and be alert for other no-radio aircraft landing and other aircraft making fly-bys (closed traffic). (Fly-bys or low approaches will only be conducted on Runway 18L/36R by EAA pilots who have been briefed and authorized to conduct such operations). Absolutely NO fly-bys or low approaches will be conducted by any aircraft without an appropriate briefing.
4. Runway 18R/36L will be used for some inbound traffic from FISK.
5. No-radio aircraft must use Runway 18L/36R as the primary runway, or when traffic dictates Runway 36L/18R. When landing 18L/36R and parking in the area west of the runway, plan a midfield turnoff—hold short of 18R/36L. Look for the FAA controller wearing a pink shirt/vest to wave you across. Expedite clearing the landing runway.

Oshkosh Area IFR Special Traffic Management Program

Effective July 25 through August 2, 1995, a special traffic management program will be in effect daily, at Oshkosh from 0700-2030 hours CDT (1200–0130 UTC). At other reservation airports the time period is 0600–2030 hours CDT (1100–0130 UTC). Chicago ARTCC will assign arrival times for each IFR flight arriving the OSH area.

Pilots will be issued a code that must be included in the remarks section of the flight plan. The OSH area is defined as a 30 nautical miles (NM) radius of the OSH VOR and includes the following airports: [OSH] Oshkosh, Wittman Field; [ATW] Appleton, Outagamie County; [FLD] Fond du Lac; and [8D1] New Holstein.

Reservations are not required for ATW arrivals filing the following routes: TVC V420 GRB ATW; HIC V26 GRB ATW; MKG V450 GRB ATW; RHI GRB ATW; DLH GRB ATW; or GEP GRB ATW.

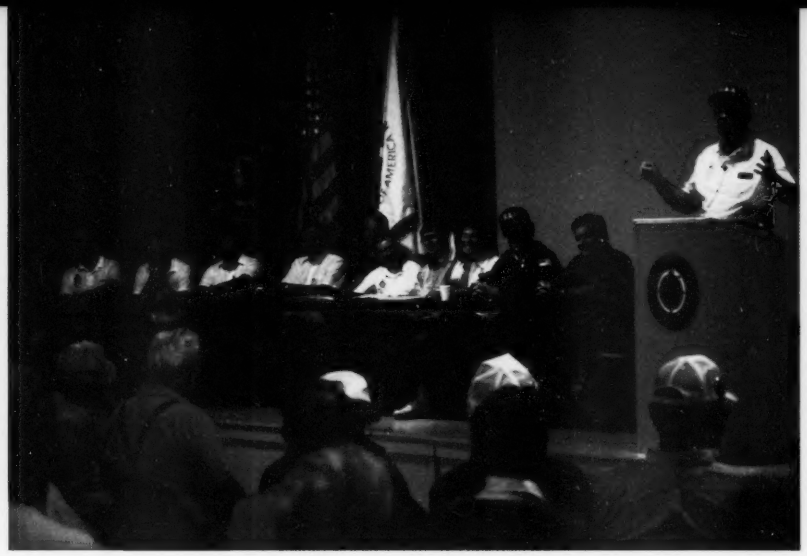
IFR Reservations

1. Beginning July 23 through August 2, 1995, arrival reservations may be obtained two calendar days in advance of arrival July 25 through August 2, 1995, by calling the Computerize Voice Reservation System (CVRS) at 1–800–875–9755. The CVRS is available 24 hours a day. See the NOTAM for complete calling information. The number for computer modem operation is 1–800–875–9762. Pilots issued an arrival time slot will receive a code which must be included in the remarks section of their flight plans. These numbers are only for IFR reservations. These numbers are not for information.
2. Adherence to arrival times shall be within 5 minutes before to 15 minutes after the assigned time of arrival in order to avoid substantial delays.
3. VFR (on top) will not be accepted to OSH area. Air files and/or changes of destination to OSH or any other reservation airport (see above) will not be accepted.
4. Flight plans shall be filed at least 4 hours in advance and shall include the reservation code in the remarks section. NOTAM is encouraged.
5. A reservation does not reserve/guarantee a landing or a parking spot if the destination airport is at capacity. It does allow IFR access into OSH.

Seaplane Operations

The Vette Seaplane Base, 5 miles southeast of Oshkosh on the west shore of Lake Winnebago will be operational July 25 through August 2, 1995, from 0800 to 1800 hours CDT.

1. Seaplane arrivals are to follow the routes shown in the NOTAM. When over Lake Winnebago, pilots are to descend to a safe altitude to avoid



the traffic pattern for Runway 27 at OSH.

2. Do not use the VFR arrival transition over Ripon and do not contact Oshkosh tower. During the afternoon airshows (see schedule on page 2 of NOTAM) the Oshkosh airport is closed to inbound and outbound traffic, therefore, it will be necessary to land outside of the boundary of the OSH Class D airspace and taxi to the base.
3. To orient yourself, fly a pattern from north to south at 600 feet AGL with a left turn out. Landing and takeoff patterns will be at the discretion of the pilot. Avoid flying low over boats and cottages. Pilot briefings are mandatory prior to local flights or departures.
4. Operators are authorized to deviate from the two-way radio communication requirements specified in FAR § 91.129(C) for arriving and departing at the 1995 Experimental Aircraft Association Convention.
5. Radio frequency for the Vette Seaplane Base is 123.3 MHz, however, a radio is not required to operate into or out of the base. Boats are available to take you to and from your aircraft.
6. Larger aircraft may anchor in the bay next to the lagoon.
7. Amphibian aircraft have a special parking area at the convention site. It is located south of the Antique/Classic area west of Runway 18R/36L.
8. No flying under 600 feet AGL over the bay except to take off or land.
9. Taxi slow in bay near lagoon. Expect heavy traffic entering and leaving lagoon.
10. No take off or landing in the lagoon.
11. Contact Vette Seaplane Base on 123.3 MHz for water conditions.
12. Be alert for warbirds operating from Fond du Lac to Oshkosh at 2,800 feet.

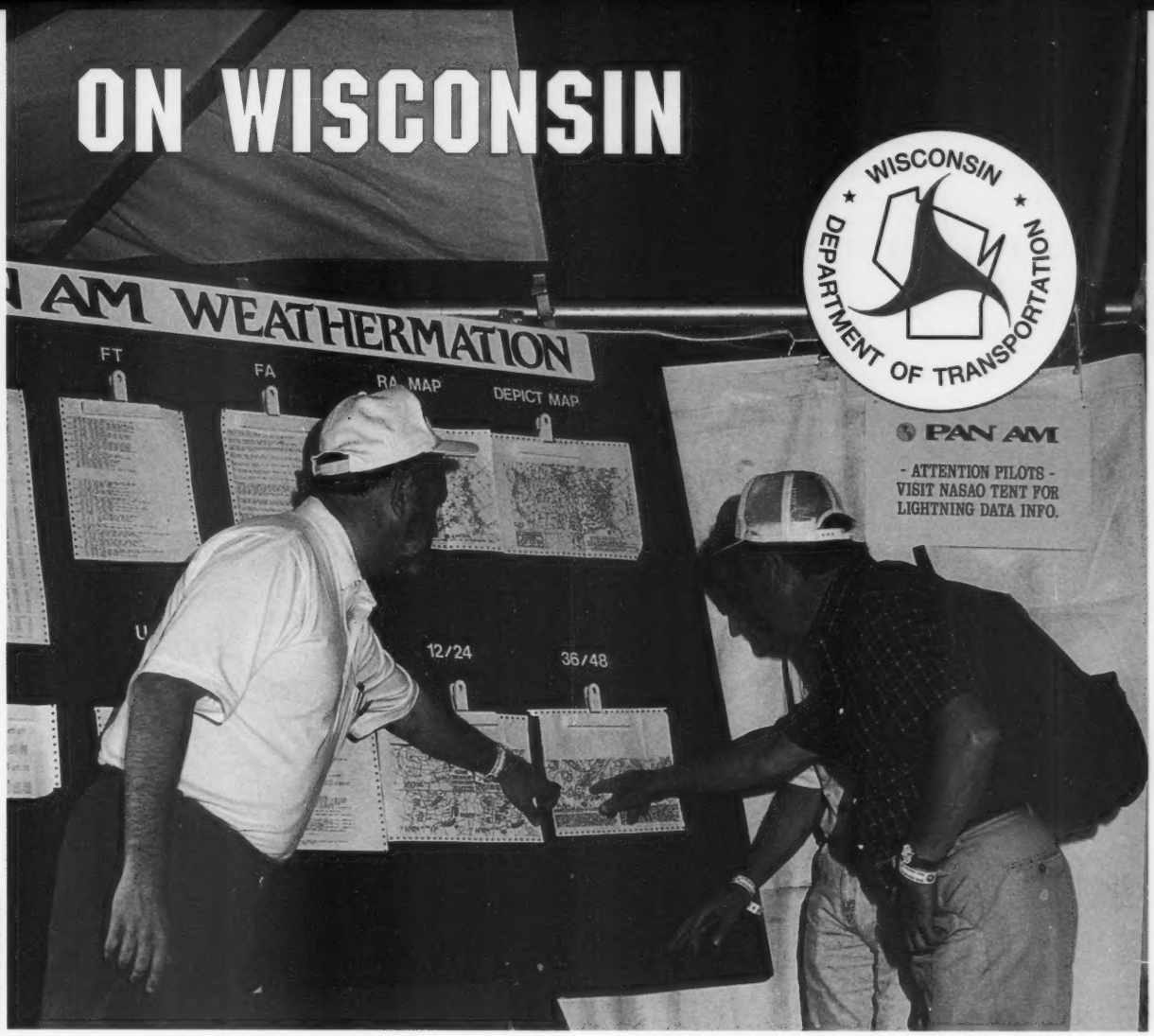
Ultralight Approach and Departure Information

1. Ultralight operating hours are from sunrise to 0900 hours and 1830 to 2015 hours CDT. Operations from 0900 to 1800 hours require approval from Ultralight Headquarters.
2. Ultralights should remain clear of Runway 18/36.
3. Ultralight pattern is clockwise for landing to the southeast.
4. Departing traffic has the right of way.
5. Do not over fly houses, livestock, people, etc., closer than 500 feet vertically.
6. Be alert for aircraft inbound from FISK entering a left base for Runway 36. Be alert for aircraft arriving and departing the Oshkosh area.
7. Compliance with the ultralight procedures outlined in the Oshkosh '95 NOTAM waives the requirements of FAR § 103.17.

Helpful Hints and Safety Information for All Aircraft

1. Monitor your fuel status. If critical advise ATC immediately.
2. Leave lights on within 30 miles to/from Oshkosh.
3. Don't make unnecessary radio transmissions where procedures state monitor the frequency only.
4. After landing aircraft should monitor ATC carefully for taxi instructions. Don't turn back onto the runway. To expedite traffic don't stop on the runway unless directed by ATC personnel.
5. After exiting the runway follow the EAA flagperson's directions.
6. If the field is IFR, taxiing is prohibited for all aircraft except for those with an IFR clearance.
7. Unless landing at FLD, remain clear of FLD airport while the temporary control tower is operating.
8. Student pilot training is prohibited during the convention period.
9. Check 121.5 MHz before engine shutdown to detect inadvertent ELT activation.
10. Do not stand on, near, or walk across any runway.
11. Bring your own tiedowns.
12. All departures are to avoid the FISK arrival area and the Vette Seaplane Base located 5 miles SE of Oshkosh.
13. Pilots are encouraged to include an extra 30 minutes in their ETE's to allow for unexpected delays. Long distance flight plans with enroute stops should be filed as separate flight plans. Multi-leg or stop over flight plans with more than four hours en route are discouraged.
14. All pilots are asked to review the FSS information listed in the NOTAM.
15. Remember a flight plan is your best chance for timely SAR efforts in the event of an accident.
16. All VFR pilots are reminded to close their flight plans.

This is only some of the information listed in "Oshkosh '95" NOTAM. Pilots need to contact their local FSS for complete details including appropriate flight diagrams and charts. All pilots must use current and appropriate IFR and VFR charts. Have a safe and fun-filled fly-in. ■



H. Dean Chamberlain

by Tom Boyer, *Aviation Safety Manager, Bureau of Aeronautics, Wisconsin DOT*

Mention Wisconsin to anyone in the aviation community and immediately their thoughts turn to Oshkosh and the Experimental Aircraft Association and with good reason. The EAA's annual Fly-in and Convention held in Oshkosh is the world's largest sport aviation exhibition. If you take a closer look, you will discover that an integral part of aviation in Wisconsin is the Department of Transportation's Bureau of Aeronautics.

History

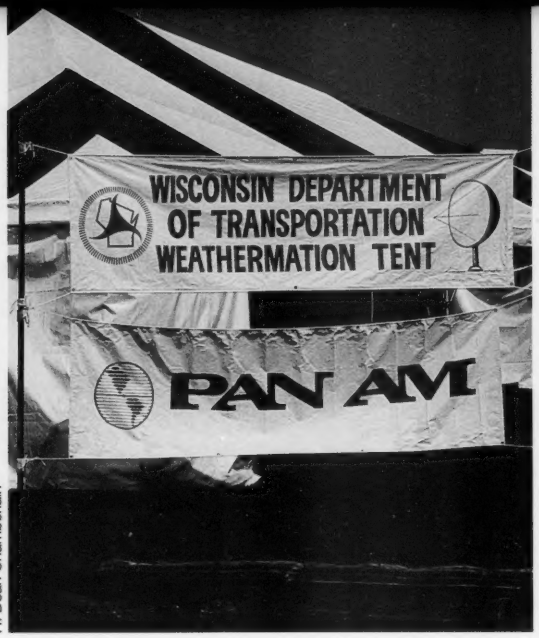
The Wisconsin Bureau of Aeronautics can trace its roots back to 1937. The Wisconsin legislature recognized the tremendous potential of aviation and realized the benefit it could bring to the State so it created the Wisconsin Aeronautics Board. This advisory board made recommendations to legislature on the best course of action for the State to follow in air transportation. As the aviation industry grew, an Aeronautics Commission was established. The Commission was soon replaced by a State Aeronautics Agency, which in 1968, joined the newly created Department of Transportation.

Today, the Bureau of Aeronautics is responsible for guarding the interests of those engaged in all phases of aviation; to formulate, recommend, and promote reasonable regulations in the interests of safety; and to coordinate the state's aviation activities with those of other states and the federal government.

The Bureau is headed by a director and is divided into three sections: the Airport Engineering Section, the Aviation Management and Education Section, and the Airport Program Section. These sections are responsible for a variety of programs, which include three regulatory functions: registration of civil aircraft, certification of new airport sites, and issuance of permits for proposed tall structures.

The Bureau's major emphasis has been airport development. In fact since

WIS. B.O.A.



H. Dean Chamberlain

John Dorcey, Wisconsin Bureau of Aeronautics, teaching a class at an IFR/VFR seminar sponsored by WIS., B.O.A.

1975, the Bureau has participated in 433 projects providing over $487,000,000 in State and Federal aid for airports. Project managers, assisted by airport engineering technicians, provide technical assistance and project administration from the start of project planning, through design and construction, to project completion. Assistance with post-construction maintenance programs is also provided by the Bureau.

Recently the Bureau announced that construction would begin in Rice Lake for Carl's Field, the first new public airport in Wisconsin in 20 years. This exciting new project, totaling 5 million dollars, was funded through Federal, State and local sponsorship. The project was necessary because the existing airport was totally surrounded by development and was unable to expand to meet the growing air transportation needs of the community. The new facility satisfies the city's current need for aviation service, by accommodating larger aircraft that could not use the existing runway. The new facility will allow for expansion when demands for aviation service increase. The new airport is set to open in August of this year.

The Bureau began looking for ways to improve efficiency in the administration of projects. In 1993, Wisconsin was selected by the FAA as one of seven states to test a "Block Grant" program. Under this program, the State receives an annual Block Grant from the FAA in lieu of individual project grants for general aviation airports, including relievers and small commercial service airports. The Bureau then allocates the monies, in accordance with established priorities, to individual projects designated by the Bureau. The program has provided a substantial cost reduction in project administration.

Technology

Differential Global Positioning System (DGPS) is an approach navigation system pioneered by the Bureau. You may remember seeing the demonstration flights during the Oshkosh convention in 1993. Seen as a low-cost replacement for ILS, it uses GPS satellites and local differential signals from a ground station to guide aircraft to ILS minimums. The demonstration program involved the FAA, Fox Valley Technical College's Aviation Center, the EAA and the Bureau. Wisconsin also received one of the first three stand-alone GPS approaches in the nation into Runway 27 at Wittman Field in Oshkosh.

Something to look for in the near future is a unique instrument landing system soon to be in use in Wisconsin. The Transponder Landing System (TLS) is an alternative, three dimensional, instrument landing system that the Bureau will install and demonstrate at the Watertown Municipal Airport. This system should be operational prior to the EAA convention in Oshkosh.

The operating principle of TLS is very simple. First, TLS interrogates an aircraft transponder. A series of ground sensors placed at various locations around the airport receive the reply signal from the aircraft transponder and determines its location relative to a desired path. Flight path guidance signals are then transmitted to the aircraft on existing localizer and glide slope frequencies.

TLS will benefit aircraft owners because a Mode C Transponder, 720 channel transceiver, and localizer/glide slope receiver are the only airborne equipment needed for a TLS approach. This system could prove to be a low cost alternative to the current ILS system and, most importantly, at no additional cost to the aircraft owner. Through a partnership with the Watertown airport, the Bureau has contracted with the vendor for the system. Certification of TLS approaches will follow final FAA testing and evaluation.

The Bureau has just recently established a BBS or bulletin board system. It is designed as a method for communicating with all members of the avia-

tion community including airport design firms, contractors, airport managers, FBO's, and pilots. Features of the BBS include an E-Mail system, bid letting schedules, all forms and contracts required for airport development including the environmental phase, funding applications, fly-in schedules, contractor specifications and many others. Any interested person can access the BBS free at (608) 267–1223.

Of vital concern to the Bureau is a centralized location for immediate access to information concerning the statewide network of airports. The Bureau is addressing this concern by initiating an Airport Information System (AIMS). The Airport Information Management System is a computerized system for WisDOT employees, the FAA, airport consultants, and airport owners to access, communicate, and maintain data and information related to airports and airport projects. Examples of data and information accessible by computer are airport layout plans, property ownership maps, aerial photos, aeronautical charts, pavement condition surveys, airport data, state and national plan information, registered aircraft, airport project status, and the state and national improvement programs.

Another Bureau program receiving praise from its users is WeatherMation. WeatherMation, a satellite based weather dissemination system provided by Pan Am Weather, was developed under a grant through the Wisconsin Department of Transportation. Similar to other weather dissemination systems, such as DUAT's, WeatherMation is a hands on, "self briefing" computer terminal now located at 76 sites throughout Wisconsin. Considered one of the Bureau's most popular programs, WeatherMation offers pilots current weather, terminal forecasts, current weather radar, flight planning, and flight plan filing through modem, plus a variety of other services, free of charge. The WeatherMation sites throughout Wisconsin answer over 11 million weather requests per year, while processing more than 240,000 modem requests on an annual basis. During your visit to the EAA Convention be sure to stop by the Wisconsin DOT/Pan Am WeatherMation tent to learn more about this weather dissemination system. The tent is located northwest of the control tower.

H. Dean Chamberlain

Thomas B. Boyer, Aviation Safety Manager, Bureau of Aeronautics, Wisconsin DOT, points out locations within Wisconsin were weather and flight planning services are provided pilots by the Bureau.

Education

The State of Wisconsin has been active in aviation-space education since the late 1940's. Activities have included programs for students from kindergarten through adult levels.

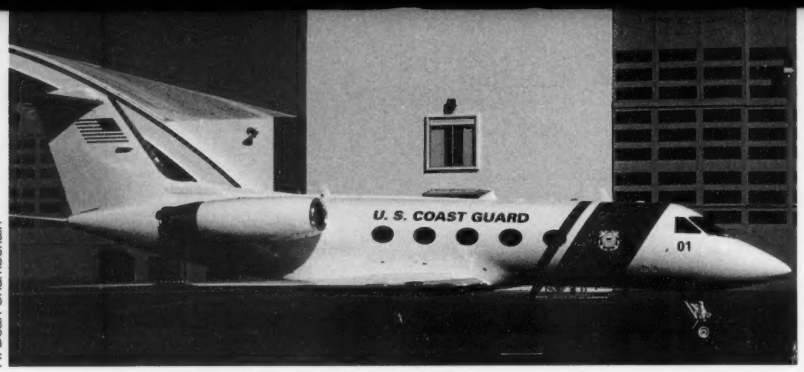
Through promotion and direct involvement, hundreds of educators use aviation-space concepts in their classes. At last count almost forty high schools in Wisconsin teach a course in aviation-space and hundreds of others infuse aviation concepts into classes. Many of those classes involve flight experience for students.

In 1989, the Bureau organized a committee to develop aviation-space programs for minority students in Milwaukee. In 1990, the State provided funding for student salaries and activities for twenty minority students to be employed in summer aviation jobs at Milwaukee's Mitchell International Airport. Since then funding has been provided each summer for thirty students. In 1994, that program was expanded to the Dane County Regional Airport in Madison for ten minority students.

In 1964, the Wisconsin Aerospace Education Committee was formed through a partnership with the Department of Public Instruction, various levels of education and industry, and the Wisconsin Aeronautics Commission. The committee is still functioning, and individual members as well as the overall committee have been recognized for excellence in education on numerous occasions. In 1987, the FAA bestowed on the committee an award for the best aviation-space education organization in the country. The Bureau has provided a leadership role for the committee since its inception.

Perhaps one of the Bureau's greatest strengths lies in its capability to listen to the aviation users within the state. Once issues are raised, partnerships are developed to aggressively address those areas. The results have been positive and have gone on to further strengthen aviation in Wisconsin.

The Wisconsin Bureau of Aeronautics has gained a reputation as a progressive and professional aviation organization. Because of this, Wisconsin is truly a leader among the states in providing safe airport facilities; exemplary airport services; and convenient, economical air transportation for its citizens. The 39 people who make up the Wisconsin Bureau of Aeronautics work hard to maintain this high level of professionalism and invite you to experience Wisconsin aviation the next time you visit. ■



H. Dean Chamberlain

GOVERNMENT AIRCRAFT
An Essential Tool

Government aircraft are an essential part of our national air transportation system. These aircraft, most of which were designed for civilian use, are flown millions of hours a year on government business, from fire fighting and pest control to operations requiring high levels of security. Government also plays a critical role in fast response to disasters and emergencies.

Many areas of our vast nation are inaccessible to ground transportation, so people and equipment must be airlifted. And with lives, property, or national security often at stake, many government missions just cannot wait for the next airline departure. For security reasons, movement of key personnel on government aircraft is often *the only choice*.

- As of 1995 there were 5,400 non-military government aircraft in operation
- 44% of government aircraft are powered by piston-driven engines, including 450 single-engine aircraft
- An additional 28% of government aircraft are helicopters
- 8% of the fleet are turbine-powered jet aircraft used for research or in-flight checking of navigation aids; only a small number of government jets are configured for passenger travel

24 hours a day, 365 days a year government aircraft are flying to protect and service the interests of all Americans

Government missions include:

FIRE FIGHTING—From combating forest and brush fires in our national forests to dousing infernos in the suburban hills of California, specially equipped government aircraft spend millions of hours a year fighting fires in every region of the country.

LAW ENFORCEMENT—Government aircraft help patrol our borders; spot, chase, and apprehend crime suspects; transport prisoners; and play a major role in drug interdiction.

SCIENTIFIC RESEARCH AND DEVELOPMENT—Government pilots give advance warning of severe weather, provide information important to Arctic and atmospheric research, and fly missions vital to on-going research in all regions of the world.

FLIGHT INSPECTION—The hundreds of thousands of daily flights made by the airlines and general aviation are kept safe and efficient by a network of navigational aids scattered across the country. Flight-checking these facilities to ensure safe and accurate readings is accomplished by government aircraft.

SURVEYING—Aircraft operated by Department of the Interior agencies such as Fish and Wildlife and the Park Service help conduct geological surveys such as wetlands mapping and volcano monitoring. Pilots conduct regular and annual wildlife surveys for certain mammals and waterfowl, such as migratory bird surveys. Government game control officers manage coyote populations in western states from government aircraft.

POWERLINE/PIPELINE PATROL—Government aircraft help patrol and inspect the nation's powerlines and oil and gas pipelines—many in remote areas—to ensure safety and proper maintenance.

AERIAL PHOTOGRAPHY—Aerial photos from aircraft are used for a wide variety of purposes: fish spotting, mapping, wildlife surveying, soil erosion checking, equipment placement, and drug interdiction.

POLLUTION CONTROL—Government pilots fly over the nation's waterways, shores, and harbors, as well as industrial and remote areas, looking for contaminants that may be polluting our waters and land.

SEARCH AND RESCUE—U.S. Coast Guard and other government agencies save many lives every year through search and rescue.

DRUG INTERDICTION—To a great extent, the war on drugs is fought in the skies through the work of government pilots, flying air patrol, aircraft escort, and aerial spotting of suspect fields and plantings, help stop the flow of drugs into the U.S.

AGRICULTURAL APPLICATION—Aircraft play a vital role in the seeding of billions of acres and protect them from the ravages of gypsy moths and other destructive insects.

TRANSPORT OF GOVERNMENT PERSONNEL—Because of security, timeliness, remote locations, and other reasons, government aircraft are often the only viable transportation choice. Safe and efficient movement of government officials is an important and legitimate use of government aircraft. Government aircraft offer round-the-clock response to national emergencies and provide the opportunity to conduct business in a timely manner.

Aircraft are invaluable to government services and programs because they save time and afford a utility not available by any other transportation means. ■

Based upon a poster issued by the General Aviation Manufacturers Association, 1400 K St., NW, Suite 801, Washington, DC 20005; (202) 393–1500/FAX (202) 842–4063.

AirspaceCORNER

• Phonetic Alphabet

The first question in the Airspace Corner of the Flight Forum in the January-February, 1994 issue of FAA Aviation News is an interesting comment about the new alphabet classes of airspace. The reader asks, "The new classes of airspace, A, B, C, D, E, and G, all sound pretty much the same. Why don't we all use the phonetic alphabet?"

Your answer stated, ". . . you are authorized to use the phonetic designators during your request and again during your acknowledgment." It is interesting in your example, you picked an example using Class Charlie. Just for fun, pronounce out loud, "Class C." Then pronounce out loud "Class E." Under the best of acoustical conditions, it is extremely difficult to differentiate between the pronunciations of Class C and Class E. In an aircraft cockpit, with all of the associated noise and distractions, it is impossible to know for sure if the controller said, "Class C or Class E." In areas of the country where there are adjoining types of airspace it can not only be confusing, but potentially dangerous.

So I ask the same question as the other reader with a slightly different twist, rather than asking if the pilots can use the phonetic alphabet to clarify a controller's transmission, why can't controllers use the phonetic alphabet and avoid the confusion in the first place? They do it with ATIS, surely the airspace is at least equally important.

Scott Gardiner
Renton, WA

You are right. Change 3 of AIM discusses air traffic control's optional use of the phonetic alphabet when referring to the various airspace classes.

• Leadville Airport

I enjoyed your January-February 1995 article "Flight Amid Vertical Terrain." There is a need for more good articles addressing the safety concerns of flying in the mountains.

I have been flying out of Lake County Airport for seven years. I would like to offer some corrective information regarding North America's highest airport at 9,927 feet MSL.

The photograph on page 9, taken of a C–172 on Runway 16 at Lake County Airport in Leadville, CO, has a view of Mt. Elbert in the background. This view is looking approximately 220 degrees, not north as the description below the photo indicates. Mt. Elbert should be give due credit as the tallest peak in the Rocky Mountain Range. It stands 14,433 feet MSL.

The length of the only runway at Lake County has been incorrectly listed as 4,800 feet. The runway was lengthened in 1993 from 5,300 feet to 6,400 feet.

The aircraft at Lake County Airport includes 3 C–172's, 1 C–172XP, 1 C–182, and 1 M20B.

The Lake County Airport managers give free landing certificates to those flying into the airport, so fly up and get some mountain flying experience.

Tom D. Moore
Buena Vista, CO

Thanks for the information. Lake County Airport (LXV) is listed in the Airport/Facility Directory, Southwest volume, under Leadville, CO. The airport's single runway, Runway 16–34, is asphalt, 6,400 feet long, and 75 feet wide. CTAF/Unicom is 122.8. The airport telephone number is (719) 486-2627. We checked with the airport about listing the telephone number, and we were told that the airport's one FBO offers a one-day mountain flying course for anyone interested in learning more about mountain flying. Interested pilots can call the airport for details.

Colorado Pilots Assoc.

• Wings

I recently received my Phase IX wings by participating in the Pilot Proficiency Awards Program and was told that Phase X is the furthest the program goes. Are there any plans for phase wings beyond X?

Name withheld

Because of budgetary reasons, the Aviation Safety Program has no plans at this time to extend the program beyond Phase X. However, we would be interested in your comments and recommendations. They should be sent to Roger M. Baker, Jr., National Aviation Safety Program Manager, AFS-810, 800 Independence Ave., SW, Washington, DC 20591.

• Wind Conditions and Flight

I have a question about flying light planes in high wind conditions. Is there any guideline for determining a maximum wind velocity beyond which flight safety is dubious? I have read that if the wind velocity is greater than one half of the stall speed of the aircraft in the landing configuration (24 knots for my airplane) it is not even safe to taxi the aircraft, but at our airport there are

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Send letters to Editor, FAA Aviation News, AFS–810, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267–9463. INTERNET address: Phyllis_Duncan@mail.hq.faa.gov

those who think you should be able to fly at any wind speed. In one case, during a BFR, the instructor thought that we would be safe to do touch and go's with winds gusting up to 25 knots. I have had trouble keeping the plane from weather cocking in 15 knot winds so I do not have the confidence this instructor seemed to possess. If there are guidelines, the Flight Service Stations should issue advisories similar to the boating advisories we receive for inland lakes.

Tim Brown
Anderson, SC

This is a question about aircraft certification, aircraft limitations, pilot limitations, and common sense. Generally speaking, the demonstrated crosswind component wind speed listed in an aircraft's pilot operating handbook is not an operating limitation. It is the maximum crosswind component during which the manufacturer demonstrated the aircraft's ability to maintain directional control under ideal conditions in a new aircraft using experienced test pilots. The absolute design crosswind component limitation of any aircraft is when the pilot cannot maintain directional control in a crosswind using all available control inputs. This is normally the time to find a runway with the wind coming down the centerline. This is a brief technical answer for you about aircraft certification numbers. The common sense answer is a pilot should not fly in any condition in which the pilot does not feel comfortable or is exceeding his/her competency level. Some pilots have the ability and proficiency to fly at their aircraft's physical limitations. Others only think they can. The question is how do you know the difference. You don't until you find yourself in a situation that might be beyond your ability to control the outcome. Play it safe and don't exceed your own personal limitations. To answer your question about FSS's issuing advisories, they do by giving the wind speed and direction. Then each pilot must make his or her own decision based upon the type of aircraft and the pilot's ability to fly the aircraft in the conditions given.

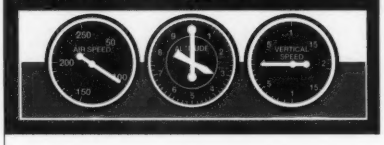
• Postflight

Regarding your article, "Post-flight?" (October 1994), I wish I had read it when I started flying many years ago and saved myself a lot of frustration. I was trained to do a thorough preflight, but I had to learn the "more thorough" post-flight the hard way after many delayed and even canceled flights and vacations with the family all packed up and ready to go. Like preflighting the plane and finding a dead, misfiring, or hot mag; an unraveling, ready to break V-belt; a nick on the propeller requiring filing; a forgotten master switch "on" since last flight that killed the battery; a thoroughly oiled fuselage belly from a leaking crankcase gasket unnoticed after the last landing; and many other little items that required timely attention if you were to keep your machine in tip-top shape and therefore safe. Thanks for a good article!

E. Aguilar, M.D.
Montgomery, WV

Better late than never, as the old saying goes. Looks like the doctor's pilot prognosis is good.

InstrumentCORNER



• Simulator Instruction

This letter is about Mr. Anderson's question and your response regarding the requirement for an instructor during the accumulation of simulator experience. This question keeps getting asked—I did myself many months ago—because you just don't answer the question. Perhaps we're "dogs who won't let go of the bone," but it sure seems that's just your response, too. You quote FAR §61.51(b)(2)(v) and (c)(5) as your support. Mr. Anderson would agree regarding "pilot ground trainer instruction," I think, but I'll ask it for him: How does your reply show that an instructor is needed unless you first show me something that says an instructor is required for currency requirements. Your references are only for required training requirements.

Lloyd J. Probst
Montgomery, AL

Well, "Rover," you could be right. We just might have a bone between us. But all joking aside, as one old dog to another, FAA policy for logging instrument training in an FAA-approved simulator to meet instrument currency or training requirements is based on the references given. If the required appropriately rated instructor signoff is not shown, the simulator time is not credible towards meeting IFR currency or training requirements.

There are no provisions in the FAR to permit a person to utilize a ground training device, flight training device, or a flight simulator to meet either the flight experience requirements for a certificate or rating, or the recent experience requirements of Part 61, except where such use is validated by an authorized instructor who has either given and endorsed the use as instruction, instrument currency, or an instrument competency check. In the clear absence of such provisions, the FAA will only accept flight experience in such devices when appropriately logged and certificated by an authorized instructor.

A note for all readers, we have answered this question several times, and like questions about logging PIC time and instructors flying without a medical, we know everyone may not agree with the answer given, but the answer given is FAA policy and there are no anticipated policy changes planned. We don't plan on running anymore questions about this issue in the near future.

Government Aircraft to Meet FAA Requirements

A new law in effect since April 23 mandates that government-owned aircraft must meet FAA's civil aircraft requirements, including crew and aircraft safety standards. The new mandate affects more than 5,000 public airplanes and helicopters operating in the U.S.

The Department of Transportation has granted an exemption to government aircraft that provide cost-reimbursable transportation for official government business.

The Advisory Circular 00–1.1, Government-Owned Aircraft, is available in its entirety from Department of Tranportation, M-45.3, General Services Section, Washington, DC 20590

Updating the AIM

The *Airman's Information Manual* (AIM), as we know it today, will soon have a new look. In conjunction with the last change to the AIM which made the manual gender-neutral to recognize women in aviation, we are changing the name of the AIM. Effective July 20, 1995, the AIM will become the *Aeronautical Information Manual*.

A new software program is being used to produce the AIM. This required renumbering all paragraphs and adjusting the manual's format. Also, the basic manual will be printed on that date with a newly designed front cover. We believe this cover reflects the diverse culture of today's aviation community.

An Air Traveler's Guide

Extra copies of the Office of Aviation Safety's brochure, "Fly Smart" (which appeared in our April 1995 issue), may be ordered from the Consumer Information Center, Department 32, Pueblo, CO 81009.

Expired Certificate of Airworthiness

A recent rush of requests for replacement airworthiness certificates has revealed that there may be hundreds of light aircraft flying around these days with expired airworthiness certificates. Yes, *expired* airworthiness certificates.

Back in the 1940's and '50's, aircraft were maintained under "periodic" inspections. When an aircraft was due for periodic inspection, they were also issued a new airworthiness certificate—provided the aircraft passed the inspection. The agency completing the inspection would then request a "new" airworthiness certificate on Form ACA-305. The CAA representative would then complete Form 305a, and if all was to his satisfaction, a new airworthiness certificate was issued with an expiration date of one year from the date of issuance. This law remained in effect until July 17, 1956. After that date, all aircraft were issued permanent airworthiness certificates.

As many of today's aviation maintenance technicians were either not born or were not old enough to be practicing aircraft maintenance some 40 years ago, they may not be aware of these facts. Aviation maintenance technicians performing annual inspections, especially on older model aircraft, should observe the date on the airworthiness certificate. Should the date be before July 17, 1956, it is likely that this aircraft has been operating in violation of FAR § 91.203(a)(1) if the airworthiness certificate *expired* before July 17, 1957. The exceptions to this date are airworthiness certificates that have, in block 4 of Form ACA-1362, the statement "REMAIN IN EFFECT AS LONG AS THE AIRCRAFT IS MAINTAINED IN ACCORDANCE WITH CIVIL AIR REGULATIONS PART 43" and a signature by a CAA representative.

Although airworthiness certificates are the responsibility of the aircraft owner, the airworthiness maintenance technician should contact the owner about the possible discrepancy and that the aircraft may require an inspection by an FAA Airworthiness Inspector before the issuance of a permanent Certificate of Airworthiness. It should be emphasized that a valid airworthiness certificate is the responsibility of the owner/operator, although most (if not all) aircraft owners, like mechanics, simply look in the aircraft just to see if an airworthiness certificate is present. They do not observe the date. Observing the date on this certificate by the aviation maintenance technician during the annual inspection is a gesture of good will. . . and mutual respect between owner/operator and mechanic.

Honoring Women Pilots

The Delaware Aviation Memorial Foundation is raising funds to complete a memorial honoring women pilots at the New Castle County Airport in Wilmington, DE. The proposed memorial is a life-sized statue of a woman pilot, wearing full flying gear, by Delaware sculptor Charles Parks.

The New Castle County Airport site is historically significant. It was there that, in September of 1942, a group of 25 American women first reported for duty to fly military aircraft. They were called the Women's Auxiliary Ferrying Squadron (WAFS) and were later integrated into the Women's Airforce Service Pilots (WASP)

Women aviators served the Country from the outset of its involvement in World War II. They flew thousands of hours, in everything from fighters to four-engine bombers. By war's end, 38 women had given their lives, and Congress finally recognized their contribution to victory in 1977.

The sponsors, Delaware Aviation Memorial Foundation, Inc., invite *FAA Aviation News* readers to join their tribute with a tax-deductible donation. They are at 5996 Kirkwood Highway, Wilmington, DE 19808; (302) 992–0505.

FAA Proposes New Pilot Type Rating

On March 16, the FAA proposed a new pilot type rating for the Boeing Model B–777–200 aircraft. The new pilot type rating designation will be issued to pilots who successfully complete the appropriate practical examination in the Boeing Model B-777-200 aircraft. The new pilot type rating will be shown in the next change to Order 8700.1, General Aviation Operations Inspector's Handbook, and Advisory Circular 61–89D, Pilot Certificates; Aircraft Type Ratings. This new Boeing aircraft

FAA Forms New Partnership

FAA Administrator David Hinson issued a proclamation to promote public awareness of helicopters and tiltrotor aircraft. The document also establishes an aviation education partnership with the rotorcraft industry. Signing the proclamation in the recent ceremony at FAA headquarters in Washington, DC, is the Chairman of the American Helicopter Society Tom Snyder (left), FAA Administrator Hinson, and the President of the Helicopter Association International Frank L. Jensen, Jr. The new partners vow "to develop, implement and support a national Public Awareness and Aviation Education program focusing on Vertical Take Off and Landing aircraft and facilities."

is expected to receive its type certificate this spring.

FAA Investigating Falsification of Aircraft Ratings

The FAA announced on May 17 that it was investigating 29 pilots for apparently falsifying type certification records to be able to fly additional aircraft that require the type certifications involved. Some of the pilots are FAA employees. As a result of the ongoing investigation, four pilots had their certificates revoked.

At this time, there is no evidence that any of the pilots involved used the various type ratings to fly in any air carrier operations. The type ratings included the historic Ford Tri-Motor, B–17 and B–25 bombers, and the Lockheed *Constellation,* all out of production, and such current business aircraft as the *Citation, Falcon,* and *Jetstar.* The BA-3100 *Jetstream* commuter aircraft type rating was also involved in few cases.

As a result of the FAA investigation which began in January 1994, the FAA has removed the pilot certification authority of four of six FAA Aviation Safety Inspectors (ASI's) and suspended the authority of eight of 12 Designated Pilot Examiners (DPE). (DPE's are non-FAA employees authorized to examine and certificate pilots.) The pilot certification authority of the ASI's and DPE's was suspended while the investigation continues.

The investigation was started after an FAA investigator discovered irregularities in the activities of one of the ASI's involved. The investigation then expanded to the current 29 individuals. The joint FAA Flight Standards and FAA Civil Aviation Security investigation involves five of the FAA's nine regions. The Regions are Great Lakes, Northwest Mountain, Southern, Southwest, and Western Pacific.

Four of the cases against the former FAA ASI's are complete. One former inspector received a one-year suspension of the pilot's Airline Transport Pilot certificate. Three had their pilot certificates revoked. Two of the revocations are being appealed. One case has been upheld by a National Transportation Safety Board (NTSB) Administrative Law Judge. The four cases involved falsification of flight records.

One of the DPE cases is complete. The DPE's certificates were revoked for falsification of records.

The remaining 11 airmen being investigated did not have airman certification authority.

As a result of the incident, the FAA has developed procedures to monitor the activities of ASI's and DPE's to prevent the possibility of such activities in the future. Included in the procedures are a review of the records of all ASI's as well as the establishment by the FAA's National Examiner Board (NEB) of a new process to screen potential DPE's. The NEB is also creating a national DPE candidate pool and future DPE's will be selected from the pool. The NEB was established in 1994 to develop initiatives and provide oversight for the DPE program.

New METAR/TAF Implementation Date

FAA's implementation of the Aviation Routine Weather Report (METAR) and Aerodrome Terminal Forecast(TAF) will not occur, as previously reported, on January 1, 1966. The implementation date is now July 1, 1996. Steve Albershein, in FAA's Office of Systems Capacity and Requirements, (202) 267–7491, is the person to contact for queries on the subject.

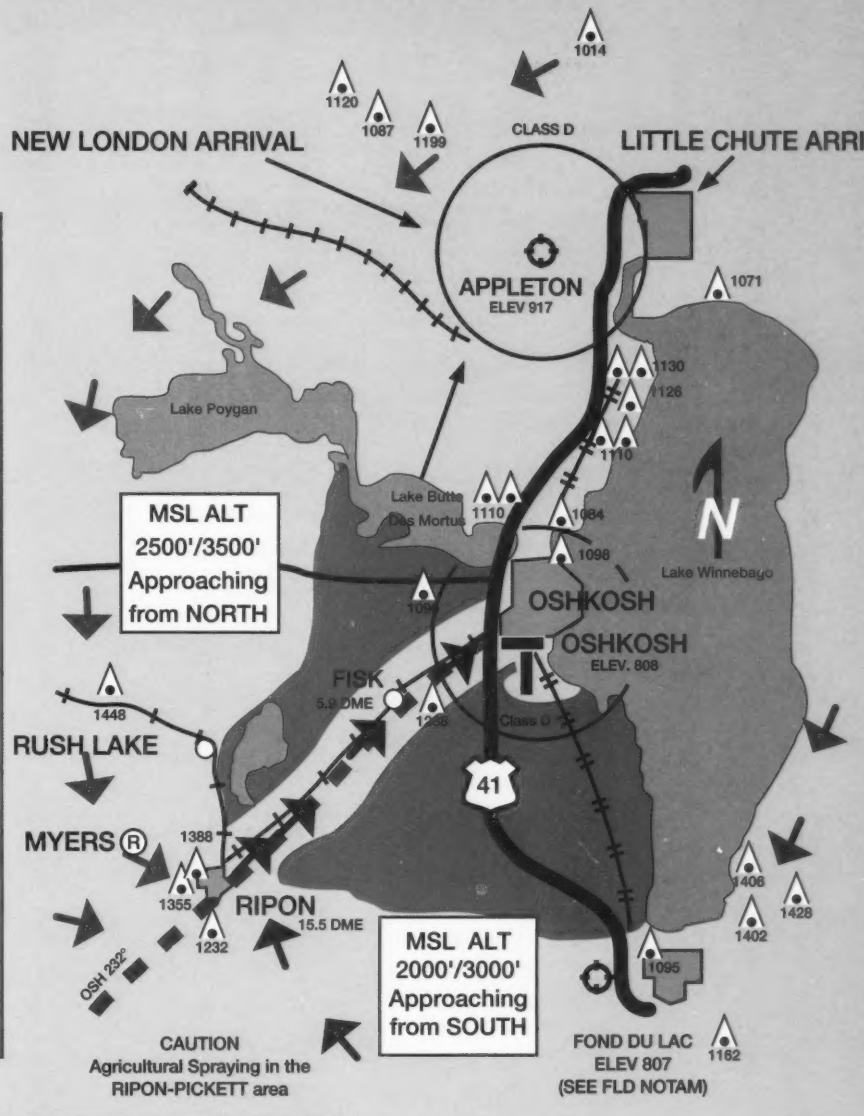
Air Show Calendar

The 26th Annual Truckee Tahoe Air Show is set for Saturday and Sunday, July 29 and 30, at the Truckee Tahoe Airport in California. "Fifty Years of Warbirds," this year's show theme, commemorates the 50th anniversary of the end of World War II. The event will feature fly-ins and hands-on static displays representing all military aviation eras. The show is dedicated to the aviation military men, women, and planes that served in defense of the United States. Truckee Tahoe Air Show organizers can be reached at (916) 582–9068.

Oshkosh EAA Convention

VFR Arrival Procedures

(Not to be used for navigation. Refer to Green Bay & Chicago Sectional Charts.)



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LONG: W88° 31.17'
Tower Freq: 119.6

OSHKOSH (OSH)
Arrival ATIS: 125.9
FISK: Monitor 120.7
RWY 9/27 Monitor 118.5
RWY 18/36 Monitor 126.6
OSH VORTAC 111.8
LAT: N43°59.43'
LONG: W88° 33.36'

RIPON
LAT: N43°50.29'
LONG: W88° 50.68'

FISK
LAT: N43°57.33'
LONG: W88° 40.75'

EMERGENCY FIELD
(MYERS)
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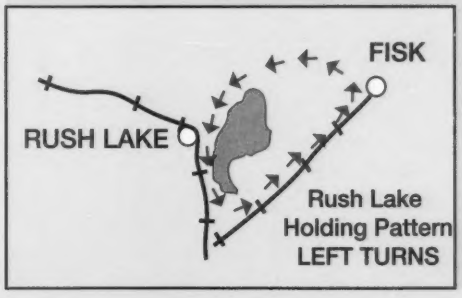
RWY 9/27 2500' X 75' (Turf)
Elev 935'
CTAF: 122.8



OSH HIGH DENSITY ZONE

(Temporary Tower)
See NOTAM
FOND DU LAC
LAT: N43° 46.25'
Long: W88° 29.31'
Tower Freq: 120.4

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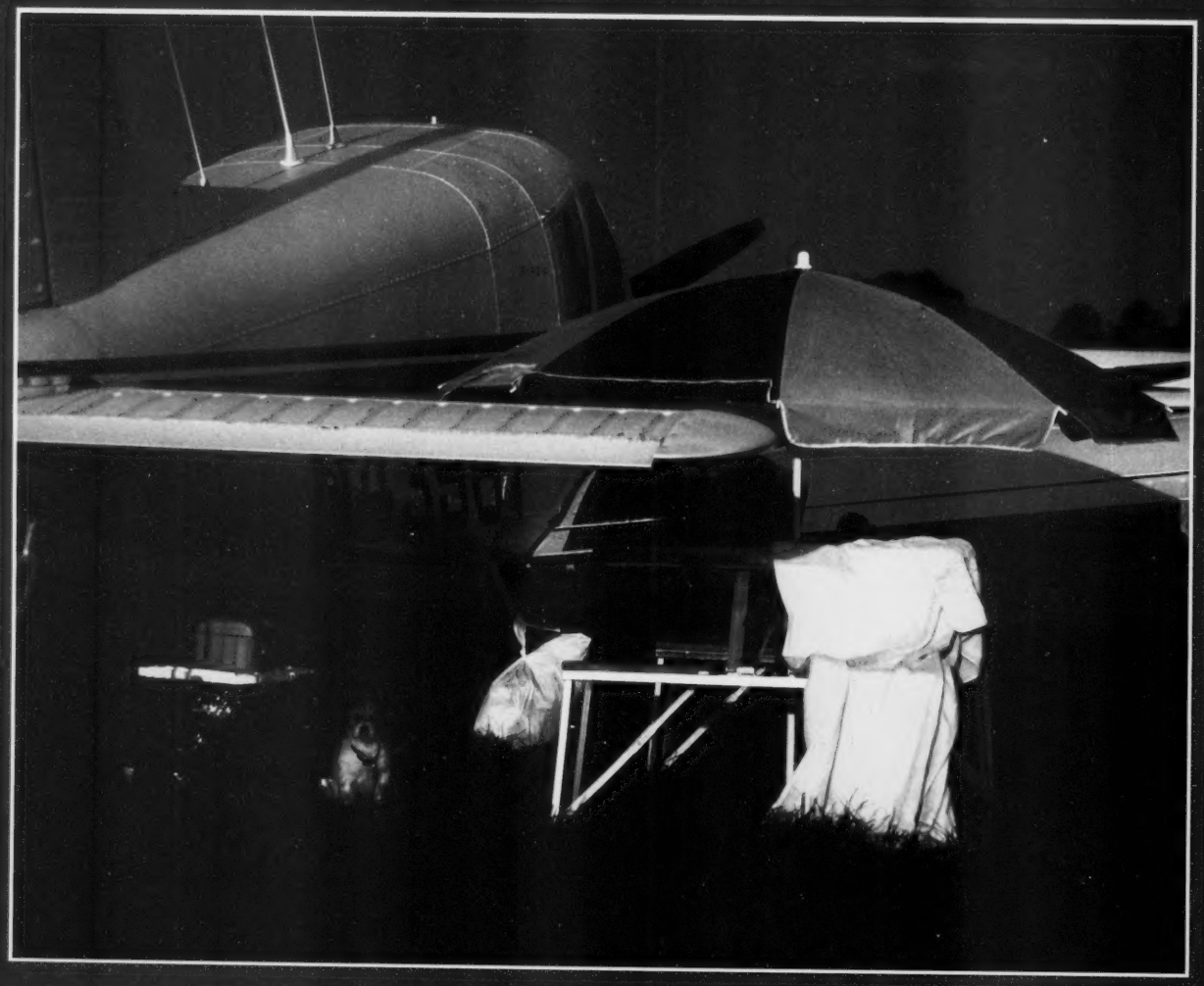
DO NOT DELAY—CRITICAL TO FLIGHT SAFETY!